Application for Certificate of Need

Barnes-Jewish Hospital
Acquire MRI

Project #5097 HS

November 3, 2014

Certificate of Need Program

NEW OR ADDITIONAL EQUIPMENT APPLICATION

Applicant's Completeness Checklist and Table of Contents

Project Name: Barnes-Jewish Hosp. - MRI Project No: 5097 15

Project Description: acquire MRI unit

Done	Page	N/A	Description

Divider I. Application Summary:

- ☐ 5 ☐ 1. Applicant Identification and Certification (Form MO 580-1861).
- ☐ 6 ☐ 2. Representative Registration (Form MO 580-1869).
- ☐ 7 ☐ 3. Proposed Project Budget (Form MO 580-1863) and detail sheet with documentation of costs.

Divider II. Proposal Description:

- ☐ 57 ☐ 1. Provide a complete detailed project description and include equipment bid quotes.
- ☐ 60 ☐ 2. Provide a legible city or county map showing the exact location of the project.
- ☐ 61 ☐ 3. Define the community to be served.
- ☐ 62 ☐ 4. Provide 2015 population projections for the proposed geographic service area.
- ☐ 63 ☐ 5. Provide other statistics to document the size and validity of any user-defined geographic service area.
- ☐ 64 ☐ 6. Identify specific community problems or unmet needs the proposal would address.
- ☐ 65 ☐ 7. Provide historical utilization for each of the past three years and utilization projections through the first three full years of operation of the new equipment.
- ☐ 65 ☐ 8. Provide the methods and assumptions used to project utilization.
- ☐ 65 ☐ 9. Document that consumer needs and preferences have been included in planning this project and describe how consumers had an opportunity to provide input.
- ☐ 68 ☐ 10. Provide copies of any petitions, letters of support or opposition received.

Divider III. Community Need Criteria and Standards:

- ☐ ___ ☒ 1. For new units address the need formula for the proposed geographic service area.
- ☐ ___ ☒ 2. For new units, address the minimum annual utilization standard for the proposed geographic service area.
- ☐ ___ ☒ 3. For any new unit where specific need and utilization standards are not listed, provide the methodology for determining need.
- ☐ 72 ☐ 4. For additional units, document compliance with the optimal utilization standard, and if not achieved, provide documentation to justify the additional unit.
- 5. For evolving technology address the following:
  - ☐ ___ ☒ - Medical effects as described and documented in published scientific literature;
  - ☐ ___ ☒ - The degree to which the objectives of the technology have been met in practice;
  - ☐ ___ ☒ - Any side effects, contraindications or environmental exposures;
  - ☐ ___ ☒ - The relationships, if any, to existing preventive, diagnostic, therapeutic or management technologies and the effects on the existing technologies;
  - ☐ ___ ☒ - Food and Drug Administration approval;
  - ☐ ___ ☒ - The need methodology used by this proposal in order to assess efficacy and cost impact of the proposal; and
  - ☐ ___ ☒ - The degree of partnership, if any, with other institutions for joint use and financing.

Divider IV. Financial Feasibility Review Criteria and Standards:

- ☐ 77 ☐ 1. Document that sufficient financing is available by providing a letter from a financial institution or an auditor's statement indicating that sufficient funds are available.
- ☐ 79 ☐ 2. Provide Service-Specific Revenues and Expenses (Form MO 580-1865) projected through three full years beyond project completion.
- ☐ 77 ☐ 3. Document how patient charges were derived.
- ☐ 77 ☐ 4. Document responsiveness to the needs of the medically indigent.

Divider I: Application Summary

Divider I. Application Summary:

1. Applicant Identification and Certification (Form MO 580-1861).

See attached.

2. Representative Registration (Form MO 580-1869).

See attached.

3. Proposed Project Budget (Form MO 580-1863) and detail sheet.

See attached.

Divider I: Attachments

Certificate of Need Program

APPLICANT IDENTIFICATION AND CERTIFICATION

*(must match the **Letter of Intent** for this project, without exception)*

1. Project Location *(attach additional pages as necessary to identify multiple project sites.)*

Title of Proposed Project	Project Number
Barnes-Jewish Hospital-- Acquire MRI unit	**5097HS**
Project Address (Street/City/State/Zip Code)	**County**
a site just northeast of 5225 Midamerica Plaza St. Louis, MO 63129	St. Louis

2. Applicant Identification *(information must agree with previously submitted Letter of Intent)*

List All Owner(s): *(list corporate entity)*	Address (Street/City/State/Zip Code)	Telephone Number
Barnes-Jewish Hospital	One Barnes-Jewish Hospital Plaza St. Louis, MO 63110	314-286-0629

List All Operator(s): *(list entity to be licensed or certified)*	Address (Street/City/State/Zip Code)	Telephone Number
Barnes-Jewish Hospital	One Barnes-Jewish Hospital Plaza St. Louis, MO 63110	314-286-0629

3. Ownership *(Check applicable category)*

☑ Nonprofit Corporation ☐ Individual ☐ City ☐ District
☐ Partnership ☐ Corporation ☐ County ☐ Other: _____

4. Certification:

In submitting this project application, the applicant understands that:

(A) The review will be made as to the community need for the proposed beds or equipment in this application;
(B) In determining community need, the Missouri Health Facilities Review Committee (Committee) will consider all similar beds or equipment within the proposed service area;
(C) The issuance of a Certificate of Need (CON) by the Committee depends on conformance with its Rules and CON statute;
(D) A CON shall be subject to forfeiture for failure to incur an expenditure on any approved project six (6) months after the date of issuance, unless obligated or extended by the Committee for an additional six (6) months;
(E) Notification will be provided to the CON Program staff if and when the project is abandoned; and
(F) A CON, if issued, may not be transferred, relocated, or modified except with the consent of the Committee.

We certify the information and data in this application as accurate to the best of our knowledge and belief by our representative's signature below:

5. Authorized Contact Person *(attach a Contact Person Correction Form if different from the Letter of Intent)*

Name of Contact Person		Title
Greg Bratcher		Director, Policy Analysis
Telephone Number	**Fax Number**	**E-mail Address**
314-286-0629	314-474-8893	gbratcher@bjc.org
Signature of Contact Person		**Date of Signature**
		8/19/2014

MO 580-1861 (05-02)

Certificate of Need Program

REPRESENTATIVE REGISTRATION

*(A registration form must be completed for **each** project represented)*

Project Name	Number
Barnes-Jewish Hospital -- Acquire MRI unit	5097HS

(Please type or print legibly)

Name of Representative	Title
Greg Bratcher	Director, Policy Analysis

Firm/Corporation/Association of Representative (may be different from below, e.g., law firm, consultant, other)	Telephone Number
BJC HealthCare	314-286-0629

Address (Street/City/State/Zip Code)
4901 Forest Park Ave.
Suite 1220; MS 90-75-574
St. Louis, MO 63108

Who's interests are being represented?
(If more than one, submit a separate Representative Registration Form for each.)

Name of Individual/Agency/Corporation/Organization being Represented	Telephone Number
BJC HealthCare	314-286-0629

Address (Street/City/State/Zip Code)
4901 Forest Park Ave.
Suite 1220; MS 90-75-574
St. Louis, MO 63108

Check one. Do you:

- [x] Support
- [ ] Oppose
- [ ] Neutral

Relationship to Project:

- [ ] None
- [x] Employee
- [ ] Legal Counsel
- [ ] Consultant
- [ ] Lobbyist
- [ ] Other *(explain)*:

Other information:

I attest that to the best of my belief and knowledge the testimony and information presented by me is truthful, represents factual information, and is in compliance with §197.326.1 RSMo which says: *Any person who is paid either as part of his normal employment or as a lobbyist to support or oppose any project before the health facilities review committee shall register as a lobbyist pursuant to chapter 105 RSMo, and shall also register with the staff of the health facilities review committee for every project in which such person has an interest and indicate whether such person supports or opposes the named project. The registration shall also include the names and addresses of any person, firm, corporation or association that the person registering represents in relation to the named project. Any person violating the provisions of this subsection shall be subject to the penalties specified in §105.478, RSMo.*

Original Signature	Date
	3/17/2014

MO 580-1869 (11-01)

Certificate of Need Program

PROPOSED PROJECT BUDGET

Description	Dollars	
COSTS:*		
1. New Construction Costs ***	$0	
2. Renovation Costs ***	60,000	
3. **Subtotal Construction Costs** (#1 plus #2)	$60,000	
4. Architectural/Engineering Fees	$0	
5. Other Equipment (not in construction contract)	0	
6. Major Medical Equipment	1,996,460	
7. Land Acquisition Costs ***	0	
8. Consultants' Fees/Legal Fees ***	0	
9. Interest During Construction (net of interest earned) ***	0	
10. Other Costs ****	0	
11. **Subtotal Non-Construction Costs** (sum of #4 through #10)	$1,996,460	
12. **Total Project Development Costs** (#3 plus #11)	**$2,056,460**	**
FINANCING:		
13. Unrestricted Funds	$2,056,460	
14. Bonds	0	
15. Loans	0	
16. Other Methods (specify)	0	
17. **Total Project Financing** (sum of #13 through #16)	**$2,056,460**	**
18. New Construction Total Square Footage	0	
19. New Construction Costs Per Square Foot *****	0	
20. Renovated Space Total Square Footage	0	
21. Renovated Space Costs Per Square Foot ******	0	

* *Attach additional page(s) to provide details of how each line item was determined, including all methods and assumptions used.*

** *These amounts should be the same.*

*** *Capitalizable items to be recognized as capital expenditures after project completion.*

**** *Include as Other Costs the following: other costs of financing; the value of existing lands, buildings and equipment not previously used for health care services, such as a renovated house converted to residential care, determined by original cost, current book value, or appraised value; or the fair market value of any leased equipment or building, or the cost of beds to be purchased.*

***** *Divide new construction costs by total new construction square footage.*

****** *Divide renovation costs by total renovation square footage.*

SIEMENS

Siemens Medical Solutions USA, Inc.
51 Valley Stream Parkway, Malvern, PA 19355
Fax: (866) 306-6681

SIEMENS REPRESENTATIVE
Arno Perlow - (866) 872-9745

Customer Number: 0000004627

Date: 8/7/2013

BJC HEALTHCARE
4353 CLAYTON AVE
SAINT LOUIS, MO 63110-1621

Siemens Medical Solutions USA, Inc. is pleased to submit the following quotation for the products and services described herein at the stated prices and terms, subject to your acceptance of the terms and conditions on the face and back hereof, and on any attachment hereto.

Table of Contents **Page**

Proposal valid until 9/21/2013

The system quoted herein is provided to BJC Healthcare via the BJC Collaborative Limited Discount Pricing Promotion ("Promotion") which contain the following terms which are incorporated and made part of this quotation and any non-contingent Purchase Order issued by BJC HEALTHCARE:
1. The pricing in this proposal shall expire upon the earlier of: A). The Quote expiration date reflected herein, or B). September 21, 2013, whichever date occurs first.
2. All committed Product orders must be scheduled for delivery with eighteen (18) months after receipt by Siemens of a Binding purchase order with delivery to occur no later than twenty-four (24) months after receipt of any such order.
3. A minimum four year point of sale (POS) service contract with Siemens must accompany all Product orders.
4.BJC HEALTHCARE, as applicable, shall accurately disclose to Federal and State health care payors and fully and accurately reflect where and as appropriate to the applicable reimbursement methodology, all services and other items, including any and all discounts received from Siemens under this Promotion, in compliance with all applicable laws, rules and regulations, including but not limited to the Social Security Act and implementing regulations related to Medicare, Medicaid and other federal and state healthcare reimbursement programs.
5 . BJC HEALTHCARE agrees that these Promotion Purchase terms are highly confidential and may not be disclosed to any third parties. BJC HEALTHCARE agrees to keep these Promotion Purchase Terms and its contents strictly confidential and not reveal the same to any other entity either now, during or after the termination or expiration of these Promotion Purchase Terms. Siemens' confidential information includes , but is not limited to, pricing and discounts, none of which BJC HEALTHCARE may reveal, directly or indirectly, to any third parties. This restriction does not apply to any information than is or becomes public through the process of law, or through no fault of either party, or that was revealed to either by a third party not owing an obligation of confidentiality to the person who owns the information disclosed. If any party is required by law to disclose the information or data supplied by another party, including copies of these Promotion Purchase terms, then the party required to disclose shall promptly notify the other party whose information and data is subject to disclosure prior to such disclosure to allow said party a reasonable opportunity to oppose the disclosure.

Accepted and Agreed to by:

Siemens Medical Solutions USA, Inc. **BJC HEALTHCARE**

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Siemens Medical Solutions USA, Inc.
51 Valley Stream Parkway, Malvern, PA 19355
Fax: (866) 306-6681

SIEMENS REPRESENTATIVE
Arno Perlow - (866) 872-9745

By (sign):		By (sign):	
Name:	Arno Perlow	Name:	
Title:	Account Executive	Title:	
Date:		Date:	

All pages of the signed proposal must be returned to Siemens to process the order - Thank you.

SIEMENS

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SIEMENS REPRESENTATIVE
Arno Perlow - (866) 872-9745

Quote Nr:	**1-6LJ5P6 Rev. 0**
Terms of Payment:	00% Down, 80% Delivery, 20% Installation Free On Board: Destination
Purchasing Agreement:	NOVATION (UHC, VHA, Provista) NOVATION (UHC, VHA, Provista) terms and conditions apply to Quote Nr 1-6LJ5P6

MAGNETOM Aera - USA

All items listed below are included for this system: *(See Detailed Technical Specifications at end of Proposal.)*

Qty	Part No.	Item Description
1	14416900	**MAGNETOM Aera - System** MAGNETOM Aera - 1.5T Tim+Dot system - The integration of the next generation Tim - "Tim 4G" and the Siemens unique Dot Engines (Day optimizing throughput Engine). Short and open appearance (145 cm system length with 70 cm Open Bore Design). Tim 4G's redesigned RF system and all-new coil architecture. - Siemens unique DirectRF(tm) technology enable Tim's new all digital-in/ digital-out design - All-new coil architecture including Dual-Density Signal Transfer Technology - Whole-body superconductive Zero Helium Boil-Off 1.5T magnet - TrueForm Magnet and Gradient Design - Actively Shielded water-cooled Siemens gradient system - Head/Neck 20 DirectConnect, Spine 32 DirectConnect, Body 18, Flex Large/Small 4 Dot offers patient personalization, user guidance and process automation that result in consistent examination results. - Brain Dot Engine is designed to simplify general brain examinations through personalized, guided and automated workflows. - Dot Display and Dot Control Centers - efficient patient preparation. Additional features include: -Tim Application Suite including Neuro, Angio, Cardiac, Body, Onco, Breast, Ortho, Pediatric and Scientific Suite - syngo MR software including 1D/2D PACE, syngo BLADE, iPAT², Phoenix, Inline Technologies. - High performance host computer and measurement and reconstruction system The system (magnet, electronics and control room) can be installed in 30sqm space. For system cooling either the Eco Chiller options or the Separator is required.
1	14416901	**Tim [204x48] XJ Gradients #Ae** Tim [204x48] XJ-gradient performance level Tim 4G with it's newly designed RF system and innovative coil architecture enables high resolution imaging and increased throughput. Up to 204 simultaneously connected coil elements in combination with the standard 48 independent RF channels, allow for more flexible parallel imaging. Maximum SNR through the new Tim 4G matrix coil technolgy. XJ - gradients The XJ- gradients are designed combining high performance and linearity to support clinical whole body imaging at 1.5T. The force compensated gradient system minimizes vibration levels and accoustic noise. The XJ gradients combine 33 mT/m peak amplitude with a slew rate of 125 T/m/s.
1	08464872	**PC Keyboard US english #Tim** Standard PC keyboard with 101 keys.
1	14416914	**Pure White Design #T+D** The MAGNETOM Aera / MAGNETOM Skyra design is available in different light and appealing variants which perfectly integrates into the different environments. The color of the main face plate cover of the Pure White Design Variant with the integrated Dot Control Centers and the unique Dot Display is brilliant white surrounded by a brilliant silver trim. The asymetrical deco area on the left side is colored white matte and also with a brilliant surrounding silver trim. The table cover is presented also in the same color and material selection.
1	14416905	**Tim Table #Ae** The new Tim Table is designed for maximized patient comfort and smooth patient preparation. The unique design of the Tim Table can support up to 250 kg (550 lbs) patients without restricting the vertical or horizontal movement.
1	14402592	**Inline Composing syngo #Tim** Automatic anatomical or angiographic composing of multiple adjacent coronal or sagittal images for presentation and further evaluation. Composed images can be automatically loaded into Graphical Slice Positioning for scan planning purposes.

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Qty	Part No.	Item Description
1	14405224	**Composing syngo #Tim** This application provides dedicated evaluation software for creation of full-format images from overlapping MR volume data sets and MIPs (starting from syngo MR B13) acquired at multiple stages.
1	14416923	**Abdomen Dot Engine #T+D** The Abdomen Dot Engine: Personalized Exam Strategies - Guidance - Automatic sequence scaling - Auto Navigator - Auto-FoV - Timeline setup and monitoring - Automatic Voice Commands - Auto Bolus Detection - Inline radial range calculation for MRCP - Inline Subtraction - Inline Registration
1	07820082	**Inline Perfusion #Tim** Automatic real-time calculation of Global Bolus Plot (GBP), Percentage of Baseline at Peak map (PBP), and Time-to-Peak map (TTP) with Inline technology.
1	14418563	**Neuro Perfusion Evaluation,USA #T+D** Neuro Perfusion Evaluation syngo provides a task card for detailed post-processing of brain perfusion data sets. Color display of the relative Mean Transit Time (relMTT), relative Cerebral Blood Volume (relCBV), corrected rel CBV, and relative Cerebral Blood Flow (relCBF) is supported. Flexible selection of the Arterial Input Function (AIF). Furthermore a calculation of maps using the pre-selected local Arterial Input Functions (AIF) is provided. The detailed evaluation of brain perfusion data sets generates parameter maps for TTP and PBP and for the hemodynamic parameters relMTT, relCBV, rel CBVcor and relCBF.
1	14402527	**SWI #Tim** Susceptibility Weighted Imaging is a high-resolution 3D imaging technique for the brain with ultra-high sensitivity for microscopic magnetic field inhomogeneities caused by deoxygenated blood, products of blood decomposition and microscopic iron deposits. Among other things, the method allows for the highly sensitive proof of cerebral hemorrhages and the high-resolution display of venous cerebral blood vessels.
1	14416908	**Tim Whole Body Suite #T+D** Tim Whole Body Suite puts it all together. This suite enables table movement for imaging of up to 205 cm (6' 9") FoV without compromise. In combination with Tim's newly designed ultra highdensity array higher spatial and temporal resolution can be achieved along with unmachted flexibility of any coverage up to Whole Body. For faster exams and greater diagnostic confidence.
1	14405328	**TWIST syngo #Tim** This package contains a Siemens unique sequence and protocols for time-resolved (4D) MR angiographic and dynamic imaging in general with high spatial and temporal resolution. syngo TWIST supports comprehensive dynamic MR angio exams in all body regions. It offers temporal information of vessel filling in addition to conventional static MR angiography, which can be beneficial in detecting or evaluating malformations such as shunts. In case of general dynamic imaging, for example an increase in spatial resolution by a factor of up to 2 at 60 seconds temporal resolution (compared to conventional dynamic imaging) is possible due to intelligent k-space sampling strategies. Alternatively, increased temporal resolution at constant spatial resolution is possible.
1	14418521	**syngo Expert-i #T+D** This software application enables remote access to the system (connected via local area network) for planning and processing.
1	14416958	**Peripheral Angio 36 #Ae** The new Tim 4G coil technology with Dual Density Signal Transfer and SlideConnect Technolgy combines key imaging benefits: excellent image quality, high patient comfort, and unmatched flexibility: - 36 channels - Dual Density Signal Transfer - Ultra light-weight - SlideConnect Technology The 36-channel coil includes 36 integrated pre-amplifiers for excellent signal-to-noise ratio. The single SlideConect Plug allows for fast and easy patient preparation. The Peripheral Angio 36 features: - 36-element design with 36 integrated preamplifiers, distributed over 6 planes with 6 elements each - Operates in an integrated fashion with Body 18 coils and with the Spine 32 . For Whole-Body examinations also with the Head/ Neck 20 - Automatic table feed and active coil switch - Can be utilized head and feet first - Both legs are independently covered with coil elements, maximizing the coil filling factor and the signal-to-noise ratio - No coil tuning - iPAT-compatible - Dual-Density Signal Transfer enables ultra-high density coil designs by integrating key RF components into the local coil - SlideConnect technology for easy coil set up - One cable only for easy handling - Includes special non-ferromagnetic coil cart for safe, user-friendly storage Applications: - High-resolution angiography of both legs incl. Pelvis (by additional use of the Body 18) with highest signal-to-noise ratio - Visualization of the iliac arteries and aorta in combinaton with Body 18 - Bilateral examinations of long bones of the legs Typically combined with: Head/ Neck 20, Body 18, Spine 32, and all flexible coils such as Flex Large 4 or Flex Small 4

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Qty	Part No.	Item Description
1	14416960	**Shoulder 16 Coil Kit #Ae** The new Tim 4G coil technology with Dual Density Signal Transfer and SlideConnect Technolgy combines key imaging benefits: excellent image quality, high patient comfort, and unmatched flexibility. The Shoulder 16 Coil Kit for examinations of the left or right shoulder consists of a base plate and two different sized iPAT compatible 16 channel coils (Shoulder Large 16 and Shoulder Small 16). These will be attached and can be relocated on the base plate.The 16-element coils with 16 integrated pre-amplifiers ensure maximimum signal-to-noise ratio. Shoulder Large 16 and Shoulder Small 16 will be connected via a SlideConnect plug for fast and easy coil set-up and patient preparation.
1	14416961	**Hand/Wrist 16 #Ae** The new Tim 4G coil technology with Dual Density Signal Transfer and SlideConnect Technology combines key imaging benefits: excellent image quality, high patient comfort, and unmatched flexibility. Hand/Wrist 16 for examinations of the left or right hand and wrist region consists of a base plate and an iPAT compatible 16-channel coil and allows high resolution imaging of the wrist and the hand within one examination. Hand/Wrist 16 will be connected via a SlideConnect plug for fast and easy patient preparation.
1	14416962	**Foot/Ankle 16 #Ae** The new Tim 4G coil technology with Dual Density Signal Transfer and DirectConnect Technolgy combines key imaging benefits: excellent image quality, high patient comfort, and unmatched flexibility. Foot/Ankle 16 for examinations of the left or right foot and ankle region consists of a base plate and an iPAT compatible 16-channel coil and allows high resolution imaging of the foot and ankle within one examination. Foot/Ankle 16 is a cable-less coil and will be connected via DirectConnect for fast and easy patient preparation.
1	14430403	**Tx/Rx 15-channel Knee Coil DDST #Ae** New 15-channel transmitter/receiver coil for joint examinations in the area of the lower extremities. Main features : - 15-element design (3x5 coil elements) with 15 integrated preamplifiers, - iPAT-compatible - SlideConnect Technology
1	14407258	**MR Workplace Table 1.2m** Table suited for syngo Acquisition Workplace and syngo MR Workplace based on syngo Hardware.
1	14407261	**MR Workplace Container, 50cm** 50 cm wide extra case for the syngo host computer with sliding front door to allow change of storage media (CD/DVD/USB).
1	08857828	**UPS Cable #Tim** Power cable for connecting the UPS Powerware PW 9130-3000i (14413662) to the ACC of MAGNETOM Tim and MAGNETOM Tim+Dot systems for backing up the computer. Standard cable length: 9 m.
1	14413662	**UPS Powerware PW9130G-3000T-XLEU** UPS system Eaton PW9130G-3000T-XLEU for MAGNETOM Tim, MAGNETOM Tim+Dot and MAGNETOM Symphony systems for safeguarding computers. Power output: 3.0 kVA / 2.7 kW Bridge time: 5 min full load / 14 min half load Input voltage: 230 VAC
1	14413663	**UPS Battery module** UPS battery module Eaton PW 9130N-3000T-EBM for all MAGNETOM Tim, MAGNETOM Tim+Dot and MAGNETOM Symphony systems for safeguarding computers. Extension for: PW9130i-3000T Battery type: Closed, maintenance-free Extension of the bridge time to: 24 minutes with a module Dimensions (H x W x D): Battery module: 346 x 214 x 412 mm incl. bracket set Weight: approx. 50 kg
1	MR_STD_RIG_INST	**MR Standard Rigging and Installation** MR Standard Rigging and Installation This quotation includes standard rigging and installation of your new MAGNETOM system Standard rigging into a room on ground floor level of the building during standard working hours (Mon. - Fri./ 8 a.m. to 5 p.m.) It remains the responsibility of the Customer to prepare the room in accordance with the SIEMENS planning documents Any rigging requiring a crane over 80 tons and/or special site requirements (e.g. removal of existing systems, etc.) is an incremental cost and the responsibility of the Customer. All other "out of scope" charges (not covered by the standard rigging and installation) will be identified during the site assessment and remain the responsibility of the Customer.
1	MR_BTL_INST ALL	**MR Standard Rigging & Install**
1	MR_PREINST_FIXED	**T+D Preinstall kit for fixed table**
1	MR_CRYO	**Standard Cryogens**

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Qty	Part No.	Item Description
1	MR_PM	**MR Project Management** A Siemens Project Manager (PM) will be the single point of contact for the implementation of your Siemen's equipment. The assigned PM will work with the customer's facilities management, architect or building contractor to assist you in ensuring that your site is ready for installation. Your PM will provide initial and final drawings and will coordinate the scheduling of the equipment, installation, and rigging, as well as the initiation of on-site clinical education.
1	MR_INITIAL_32	**Initial onsite training 32 hrs** MR_INITIAL_32 Up to (32) hours of on-site clinical education training, scheduled consecutively (Monday - Friday) during standard business hours for a maximum of (4) imaging professionals. Training will cover agenda items on the ASRT approved checklist. Uptime Clinical Education phone support is provided during the warranty period for specified posted hours. This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.
1	MR_FOLLOWUP_32	**Follow-up training 32 hrs** Up to (32) hours of follow-up on-site clinical education training, scheduled consecutively (Monday - Friday) during standard business hours for a maximum of (4) imaging professionals. Uptime Clinical Education phone support is provided during the warranty period for specified posted hours. This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.
1	MR_ECLS4GDOT	**E.class for MAGNETOM Tim 4G & Dot Users** E.class for MAGNETOM Tim 4G and Dot software users. This e.class introduces current Siemens MAGNETOM users to Tim 4G and Dot software on the MAGNETOM Skyra and Aera. System configuration, hardware and software differences will be reviewed. Dot Engines, Dot Guidance, including new features and pulse sequences will be presented and discussed. This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.
1	MR_ADD_32	**Additional onsite training 32 hours** Up to (32) hours of on-site clinical education training, scheduled consecutively (Monday - Friday) during standard business hours for a maximum of (4) imaging professionals. Training will cover agenda items on the ASRT approved checklist if applicable.This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.
1	MR_A_INT_DOT_BCLS	**MR Dot Training Class** Tuition for (1) imaging professional to attend Classroom Course at Siemens Training Center. The objectives of this class are to introduce the user interface of the common syngo platform, including Dot, and instructions on building protocols, demonstration of software functions, and hands-on sessions. This class includes lunch, economy airfare, and lodging for (1) imaging professional. All arrangements must be arranged through Siemens designated travel agency. This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.
2	MR_ECLS4GDOT	**E.class for MAGNETOM Tim 4G & Dot Users** E.class for MAGNETOM Tim 4G and Dot software users. This e.class introduces current Siemens MAGNETOM users to Tim 4G and Dot software on the MAGNETOM Skyra and Aera. System configuration, hardware and software differences will be reviewed. Dot Engines, Dot Guidance, including new features and pulse sequences will be presented and discussed. This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.
1	4MR5142869	**Armrest #MR**
1	KKTECOMR_45	**KKT ECOCHILLER 122L** The KKT ECO 122 -L chiller is a dedicated 20°C cooling system for MAGNETOM Aera which automatically adapts to the different cooling requirements (e.g. system in operation, standby, ...) to reduce the energy consumption for cooling. The cooling system must be used in combination with the IFP (Interface Panel), if there is no on-site chilled water supply at all. The IFP is included in the scope of supply.
1	CHILINST_AVT	**Chiller Start-up and Warranty for TIM**

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Qty	Part No.	Item Description
1	MRWSE	**MR Wall sign -English**
1	MR_ADDL_RIGGING	**Additional Rigging - Union Labor for Install $7,166**

System Total: $1,566,560

OPTIONS:

Qty	Part No.	Item Description	Extended Price	Initial to Accept
1	14409198	**Native syngo #Tim** Integrated software package with sequences and protocols for non-contrast enhanced 3D MRA with high spatial resolution. syngo NATIVE particularly enables imaging of abdominal and peripheral vessels and is an alternative to MR angiography techniques with contrast medium, especially for patients with severe renal insufficiency.	+ $30,000	X_____
1	14418746	**Cardiac Dot Engine, USA #T+D** Cardiac examinations: Dot Cardiac - Customized workflows that are easier to repeat. Using anatomical landmarks, standard views of the heart (such as dedicated long axis and short-axis views), are easily generated and can easily be reproduced using different scanning techniques. Scan parameters are adjusted to the patient's heart rate and automatic voice commands are given.	+ $54,000	X_____
1	14430391	**RESOLVE #T+D** RESOLVE is a diffusion-weighted, readout segmented EPI sequence optimized towards high resolution imaging with reduced distortions. The sequence uses a very short echospacing compared to single-shot EPI, substantially reducing susceptibility effects. A 2D-navigator correction is applied to avoid artefactsartifacts due to motion-induced phase errors. This combination allows diffusion weighted imaging of the breast, prostate, brain and spinewhole body with a high level of detail and spatial precision.	+ $9,000	X_____
1	14416965	**Arterial Spin Labeling 3D #T+D** ASL is a non contrast enhanced brain perfusion technique. A 3D volume is acquired with high SNR by using a turbo gradient spin echo technique and an ASL preparation module to achieve clinically feasible scan times.	+ $24,000	X_____
1	14426332	**Tx/Rx CP Head Coil #Ae** Circularly polarized no-tune transmit/receive coil with an open patient-friendly design. The integrated transmit mode allows volume selective excitation. Integrated, extremely low-noise pre-amplifiers permit very high signal-to-noise ratio. Furthermore, the coil is outfit with SlideConnect Technology, allowing for easier patient preparation and less table time for the patient.	+ $48,000	X_____
1	14416952	**Coil Storage Cart #T+D** Specially designed non-ferromagnetic cart for easy storage of the most commonly used coils and accessories.	+ $3,000	X_____
1	14416906	**Tim Dockable Table #Ae** The new Tim Dockable Table is designed for maximum patient comfort and smooth patient preparation. Tim Dockable Table can support up to 250 kg (550 lbs) patients without restricting the vertical or horizontal movement. The one step docking mechanism and the innovative multi-directional navigation wheel ensure easy maneuvering and handling. Critically ill or immobile patients can now be prepared outside the examination room for maximum patient care, flexibility and speed.	+ $45,000	X_____

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Qty	Part No.	Item Description	Extended Price	Initial to Accept
1	08464757	**Interactive RealTime #Tim** Interactive Realtime Imaging for interactive acquisition, reconstruction and display of image data. Uses ultra-fast TrueFISP and other gradient-echo sequences of high image contrast. The user can interactively navigate in all planes on-the-fly during data acquisition.	+ $30,000	X_____
1	14402593	**Tim Planning Suite** With the Tim Planning Suite, multiple regions in the entire body can be examined in a minimum of time through measurement planning on a single FoV of any desired size.	+ $18,000	X_____
1	08464740	**Flow Quantification #Tim** Special sequences for quantitative assessment of flow.	+ $12,000	X_____
1	07365419	**Argus Flow**	+ $9,000	X_____
1	14416929	**Advanced Cardiac Package #T+D** This package contains special sequences and protocols for advanced cardiac imaging including 3D and 4D syngo BEAT functionalities. It supports advanced techniques for ventricular function imaging, dynamic imaging, tissue characterization, coronary imaging, and more.	+ $30,000	X_____
1	14407334	**Argus 4D Ventr.Function syngo #Tim** syngo Argus 4D Ventricular Function software processes MR cine images of the heart and generates quantitative results for physicians in the diagnostic process.	+ $16,200	X_____
1	14416944	**DTI Package #T+D** The DTI Package is a bundle of: - Diffusion Tensor Imaging - DTI Evaluation and - DTI Tractography syngo The bundle comprehends all acquisition and postprocessing tools for comprehensive DTI exams.	+ $37,020	X_____
1	14416943	**Neuro fMRI Package #T+D** The Neuro fMRI Package is a bundle of: - Inline BOLD Imaging - 3D PACE syngo - BOLD 3D Evaluation syngo - fMRI Trigger Converter The bundle comprehends all acquisition and post processing tools for comprehensive BOLD fMRI exams.	+ $34,680	X_____
1	14416941	**Spectroscopy Package #T+D** The Spectroscopy Package is a comprehensive software package which bundles Single Voxel Spectroscopy, 2D Chemical Shift Imaging, 3D Chemical Shift Imaging and syngo Spectroscopy Evaluation. Sequences and protocols for proton spectroscopy, 2D and 3D proton chemical shift imaging (2D CSI and 3D CSI) to examine metabolic changes in the brain (e.g. in tumors and degenerative diseases) and in the prostate are included. Furthermore included is the comprehensive syngo Spectroscopy Evaluation Software which enables fast evaluation of spectroscopy data on the syngo Acquisition Workplace.	+ $30,000	X_____

FINANCING: The equipment listed above may be financed through Siemens. Ask us about our full range of financial products that can be tailored to meet your business and cash flow requirements. For further information, please contact your local Sales Representative.

ACCESSORIES: Don't forget to ask us about our line of OEM imaging accessories to complete your purchase. All accessories can be purchased or financed as part of this order. To purchase accessories directly or to receive our accessories catalog, please call us directly at 1-888-222-9944 or contact your local Sales Representative.

COMPLIANCE: Compliance with legal and internal regulations is an integral part of all business processes at Siemens. Possible infringements can be reported to our Helpdesk "Tell us" function at www.siemens.com/tell-us.

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Siemens Medical Solutions USA, Inc. General Terms and Conditions

1. GENERAL

1.1 Contract Terms. These terms and conditions constitute an integral part of any contract between Seller and Purchaser identified on the first page hereof and shall govern the sale of the products identified in such contract ("Products"). Seller shall not be bound by, and specifically objects to, any terms, conditions or other provisions which are different from or in addition to the provisions of this Agreement (even if provided to Seller concurrently with this Agreement), unless Seller specifically agrees to any such provision in a writing signed by Seller. Neither Seller's lack of objection to any such terms, nor delivery of the Products or provision of any services hereunder, shall constitute the agreement of Seller to any such terms. Purchaser acknowledges that this is a commercial and not a consumer transaction.

1.2 Acceptance. Purchaser shall be deemed to have assented to, and to have waived any objection to, this Agreement upon the earliest to occur of any of the following: Purchaser's completion or execution of this Agreement; Purchaser's acceptance of all or any part of the Products; Purchaser's issuance of a purchase order for any Products identified on Seller's quotation or proposal; or delivery of the Products to the common carrier for shipment pursuant hereto.

1.3 Refurbished/Used Products. For Products identified on this Agreement as used or refurbished Products, these Products have been previously owned and used. When delivered to Purchaser, the Products may have received mechanical, electrical and/or cosmetic reconditioning, as needed, and will comply with the manufacturer's specifications. Since pre-owned Products may be offered simultaneously to several customers, the sale of such Products to Purchaser cannot be guaranteed and is subject to continuing availability at the time Purchaser accepts Seller's offer to sell the Products. If the Products are no longer available, Seller will use its best efforts to identify other products in its inventory that may be suitable for purchase by Purchaser, and if substitute products are not acceptable to Purchaser, then Seller will cancel the order and refund to Purchaser any deposits previously paid. The warranty period for any used or refurbished Products will be separately stated on the quotation.

1.4 Third Party Products. If this Agreement includes the sale of third party products not manufactured by Seller, then Purchaser agrees and acknowledges that (a) Purchaser has made the selection of these products on its own, (b) the products are being acquired by Seller solely at the request of and for the benefit of Purchaser, in order to eliminate the need for Purchaser to issue a separate purchase order to the manufacturer of the products, (c) no representation, warranty or guarantee has been made by Seller with respect to the products, (d) the obligation of Purchaser to pay Seller for the products is absolute and unconditional, (e) Purchaser will indemnify and hold Seller harmless from and against any and all claims, regardless of the form of action, related to, resulting from or caused by the products or any work or service provided by the manufacturer of the products or any other party, (f) use of the products may be subject to Purchaser's agreement to comply with any software licensing terms imposed by the manufacturer, as well as any applicable laws, rule and regulations; and (g) the manufacturer, and not Seller, is solely responsible for any required installation, testing, validation, tracking, product recall, warranty service, maintenance, support, and complaint handling, as well as any other applicable FDA regulatory requirements, and the Purchaser will look solely to the manufacturer regarding these services and will assert no claim against Seller with respect to these products.

2. PRICES

2.1 Quotations. Unless otherwise agreed to in writing or set forth in the quotation, all prices quoted by Seller are based on U.S. dollars, and include standard and customary packaging. F.O.B. terms are set forth in Section 6.2 hereof. Domestic prices apply only to purchasers located in, and who will use the Products in, the U.S. International prices apply to all purchasers located outside of, or who will use or ship or facilitate shipment of the Products outside of, the U.S. Unless otherwise stated, the quotation shall only be valid for forty-five (45) days from the date of the quotation.

2.2 Delay in Acceptance of Delivery. Should the agreed delivery date be postponed by Purchaser, Seller shall have the right to deliver the Products to storage at Purchaser's risk and expense, and payments due upon delivery shall become due when Seller is ready to deliver.

2.3 Escalation. Unless otherwise agreed to in writing, except as to Products to be delivered within six (6) months of Seller's acceptance of Purchaser's order, Seller reserves the right to increase its prices to those in effect at the time of shipment.

3. TAXES

3.1 Any sales, use or manufacturer's tax which may be imposed upon the sale or use of Products, or any property tax levied after readiness to ship, or any excise tax, license or similar fee required under this transaction, shall be in addition to the quoted prices and shall be paid by Purchaser. Notwithstanding the foregoing, Seller agrees to honor any valid exemption certificate provided by Purchaser.

4. TERMS OF PAYMENT; DEFAULT

4.1 Payments; Due Date. Unless otherwise set forth in the quotation, Seller's payment terms are as follows: an initial deposit of 10% of the purchase price for each Product is due upon submission of the purchase order, an additional 80% of the purchase price is due upon delivery of each Product, and the final 10% of the purchase price is due upon completion of installation or when the Products are available for first patient use, whichever occurs first. Unless otherwise agreed, all payments other than the initial deposit are due net thirty (30) days from the date of invoice. Seller shall have no obligation to complete installation until the payment due upon delivery is received. All amounts payable pursuant to this Agreement are denominated in United States dollars, and Purchaser shall pay all such amount in lawful money of the United States. Partial shipments shall be billed as made, and payments for such shipments will be made in accordance with the foregoing payment terms.

4.2 Late Payment. A service charge of 1½% per month, not to exceed the maximum rate allowed by law, shall be made on any portion of Purchaser's outstanding balance which is not paid within thirty (30) days after invoice date, which charge shall be determined and compounded on a daily basis from the due date until the date paid. Payment of such service charge shall not excuse or cure Purchaser's breach or default for late payment.

4.3 Payment of Lesser Amount. If Purchaser pays, or Seller otherwise receives, a lesser amount than the full amount provided for under this Agreement, such payment or receipt shall not constitute or be construed other than as on account of the earliest amount due Seller. Seller may accept any check or payment in any amount without prejudice to Seller's right to recover the balance of the amount due or to pursue any other right or remedy. No endorsement or statement on any check or payment or in any letter accompanying a check or payment or elsewhere shall constitute or be construed as an accord or satisfaction.

4.4 Where Payment Due Upon Installation or Completion. Should any terms of payment provide for either full or partial payment upon completion of installation or thereafter, and completion of installation is delayed for any reason for which Seller is not responsible, then the Products shall be deemed installed upon delivery and the balance of payments shall be due no later than thirty (30) days from the delivery date regardless of the actual installation date.

4.5 Default; Termination. Each of the following shall constitute an event of default under this Agreement: (i) a failure by Purchaser to make any payment due Seller within ten (10) days of receipt of written notice of non-payment from Seller; (ii) a failure by Purchaser to perform any other obligation under this Agreement within thirty (30) days of receipt of written notice from Seller; (iii) a default by Purchaser under any other obligation to or agreement with Seller or Siemens Financial Services, Inc., or any assignee of the foregoing (e.g., a promissory note, lease, rental agreement, license agreement or purchase contract); or (iv) the commencement of any insolvency, bankruptcy or similar proceedings by or against Purchaser (including any assignment by Purchaser for the benefit of creditors). Upon the occurrence of any event of default, at Seller's election: (a) the entire amount of any indebtedness and obligation due Seller under this Agreement and interest thereon shall become immediately due and payable without notice, demand, or period of grace; (b) Seller may suspend the performance of any of Seller's obligations hereunder, including, but not limited to, obligations relating to delivery, installation and warranty services; (c) Purchaser shall put Seller in possession of the Products upon demand; (d) Seller may enter any premises where the Products are located and take possession of the Products without notice or demand and without legal proceedings; (e) at the request of Seller, Purchaser shall assemble the Products and make them available to Seller at a place designated by Seller which is reasonable and convenient to all parties; (f) Seller may sell or otherwise dispose of all or any part of the Products and apply the proceeds thereof against any indebtedness or obligation of Purchaser under this Agreement (Purchaser agrees that a period of 10 days from the time notice is sent to Purchaser shall be a reasonable period of notification of sale or other disposition of the Products by or for Seller); (g) if this Agreement or any indebtedness or obligation of Purchaser under this Agreement is referred to an attorney for collection or realization, Purchaser shall pay to Seller all costs of collection and realization (including, without limitation, a reasonable sum for attorneys' fees, expenses of title search, all court costs and other legal expenses) incurred thereby; and (h) Purchaser shall pay any deficiency remaining after collection of or realization by Seller on the Products. In addition, Seller may terminate this Agreement upon written notice to Purchaser

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in the event that Purchaser is not approved for credit or upon the occurrence of any material adverse change in the financial condition or business operations of Purchaser.

4.6 Financing. Notwithstanding any arrangement that Purchaser may make for the financing of the purchase price of the Products, the parties agree that any such financing arrangement shall have no effect on the Purchaser's payment obligations under this Agreement, including but not limited to Sections 4.1 and 4.2 above.

5. EXPORT TERMS

5.1 Unless other arrangements have been made, payment on export orders shall be made by irrevocable confirmed letter of credit, payable in U.S. dollars against Seller's invoice and standard shipping documents. Such letter of credit shall be in an amount equal to the full purchase price of the Products and shall be established in a U.S. bank acceptable to Seller. Purchaser shall procure all necessary permits and licenses for shipment and compliance with any governmental regulations concerning control of final destination of Products.

5.2 Purchaser acknowledges that Seller is required to comply with applicable export laws and regulations relating to the sale, exportation, transfer, assignment, disposal and usage of the Products provided under this Agreement, including any export license requirements. Purchaser agrees that such Products shall not at any time directly or indirectly be used, exported, sold, transferred, assigned or otherwise disposed of in a manner which will result in non-compliance with such applicable export laws and regulations. It shall be a condition of the continuing performance by Seller of its obligations hereunder that compliance with such export laws and regulations be maintained at all times. **PURCHASER AGREES TO INDEMNIFY, DEFEND AND HOLD SELLER HARMLESS FROM ANY AND ALL COSTS, LIABILITIES, PENALTIES, SANCTIONS AND FINES RELATED TO NON-COMPLIANCE WITH APPLICABLE EXPORT LAWS AND REGULATIONS.** If Purchaser purchases a Product at the domestic price and exports such Product, or transfers such Product to a third party for export, outside of the U.S., Purchaser shall pay to Seller the difference between the domestic price and the international retail price of such Product pursuant to the payment terms set forth herein. Purchaser shall deliver to Seller, upon Seller's request, written assurance regarding compliance with this section in form and content acceptable to Seller.

6. DELIVERY, RISK OF LOSS

6.1 Delivery Date. Delivery and installation dates will be established by mutual agreement of the parties. Seller shall make every reasonable effort to meet the agreed upon delivery date(s), but shall not be liable for any failure to meet such date(s). Partial shipments may be made.

6.2 Risk of Loss; Title Transfer. Unless otherwise agreed to in writing, the following shall apply:

(a) For Products that do not require installation by Seller, and for options and add-on products purchased subsequent to delivery and installation of Products purchased under this Agreement, delivery shall be complete upon transfer of possession to common carrier, F.O.B. Shipping Point, whereupon title to and all risk of loss, damage to or destruction of the Products shall pass to Purchaser.

(b) For Products that require installation by Seller, delivery shall be complete upon delivery of the Products to Purchaser's designated site, F.O.B. Destination; title to and all risk of loss, damage to or destruction of such Products shall pass to Purchaser upon completion of the installation.

(c) All freight charges and other transportation, packing and insurance costs, license fees, custom duties and other similar charges shall be the sole responsibility of Purchaser unless included in the purchase price or otherwise agreed to in writing by Seller. In the event of any loss or damage to any of the Products during shipment, Seller and Purchaser shall cooperate in making a claim against the carrier.

7. SECURITY INTEREST/FILING

7.1 Purchaser grants to Seller a security interest in the Products (and all accessories and replacements thereto and all proceeds thereof) until payment in full by Purchaser and satisfaction of all other obligations of Purchaser hereunder. Purchaser hereby (i) authorizes Seller to file (and Purchaser shall promptly execute, if requested by Seller) and (ii) irrevocably appoints Seller its agent and attorney-in-fact to execute in the name of Purchaser and file, with such authorities and at such locations as Seller may deem appropriate, any Uniform Commercial Code financing statements with respect to the Products and/or this Agreement. Purchaser further represents and covenants that (a) it will keep the Products in good order and repair until the purchase price has been paid in full, (b) it will promptly pay all taxes and assessments upon the Products or the use thereof, (c) it will not attempt to transfer any interest in the Products until the purchase price has been paid in full, and (d) it is solvent and financially capable of paying the full purchase price for the Products.

8. CHANGES, CANCELLATION, AND RETURN

8.1 Orders accepted by Seller are not subject to change except upon Seller's written agreement.

8.2 Orders accepted by Seller are noncancellable by Purchaser except upon Seller's written consent and payment by Purchaser of a cancellation charge equal to 10% of the price of the affected Products, plus any shipping, insurance, inspection and refurbishment charges; the cost of providing any training, education, site evaluation or other services completed by Seller; and any return, cancellation or restocking fees with respect to any Third Party Products ordered by Seller on behalf of Purchaser. Seller may retain any payments received from Purchaser up to the amount of the cancellation charge. In no event can an order be cancelled by Purchaser or Products be returned to Seller after shipment.

8.3 Seller shall have the right to change the manufacture and/or design of its Products if, in the judgment of Seller, such change does not alter the general function of the Products.

9. FORCE MAJEURE

9.1 Seller shall not be liable for any loss or damage for delay in delivery, inability to install or any other failure to perform due to causes beyond its reasonable control including, but not limited to, acts of government or compliance with any governmental rules or regulations, acts of God or the public, war, civil commotion, blockades, embargoes, calamities, floods, fires, earthquakes, explosions, storms, strikes, lockouts, labor disputes, or unavailability of labor, raw materials, power or supplies. Should such a delay occur, Seller may reasonably extend delivery or production schedules or, at its option, cancel the order in whole or part without liability other than to return any unearned deposit or prepayment.

10. WARRANTY

10.1 Seller warrants that the Products manufactured by Seller and sold hereunder shall be free from defects in material or workmanship under normal use and service for the warranty period. The final assembled Products shall be new although they may include certain used, reworked or refurbished parts and components (e.g., circuit boards) that comply with performance and reliability specifications and controls. Seller's obligation under this warranty is limited, at Seller's option, to the repair or replacement of the Product or any part thereof. Unless otherwise set forth in the Product Warranty attached hereto and incorporated herein by reference, the warranty period shall commence upon the earlier of the date that the Products have been installed in accordance with Section 12.6 hereof (which date shall be confirmed in writing by Seller) or first patient use, and shall continue for 12 consecutive months. Seller makes no warranty for any Products made by persons other than Seller or its affiliates, and Purchaser's sole warranty therefor, if any, is the original manufacturer's warranty, which Seller agrees to pass on to Purchaser, as applicable. The warranty provided by Seller under this Section 10 extends only to the original Purchaser, unless the Purchaser obtains the Seller's prior written consent with respect to any sale or other transfer of the Equipment during the term of the warranty.

10.2 No warranty extended by Seller shall apply to any Products which have been damaged by fire, accident, misuse, abuse, negligence, improper application or alteration or by a force majeure occurrence as described in Section 9 hereof or by the Purchaser's failure to operate the Products in accordance with the manufacturer's instructions or to maintain the recommended operating environment and line conditions; which are defective due to unauthorized attempts to repair, relocate, maintain, service, add to or modify the Products by the Purchaser or any third party or due to the attachment and/or use of non-Seller supplied parts, equipment or software without Seller's prior written approval; which failed due to causes from within non-Seller supplied equipment, parts or software including, but not limited to, problems with the Purchaser's network; or which have been damaged from the use of operating supplies or consumable parts not approved by Seller. In addition, there is no warranty coverage for any transducer or probe failure due to events such as cracking from high impact drops, cable rupture from rolling equipment over the cable, delamination from cleaning with inappropriate solutions, or TEE bite marks. Seller's obligation under this warranty is limited to the repair or replacement, at Seller's option, of defective parts. Seller may effectuate such repair at Purchaser's facility, and Purchaser shall furnish Seller safe and sufficient access for such repair. Repair or replacement may be with parts or products that are new, used or refurbished. Repairs or replacements shall not interrupt, extend or prolong the term of the warranty. Purchaser shall, upon Seller's request, return the noncomplying Product or part to Seller with all transportation charges prepaid, but shall not return any Product or part to Seller without Seller's prior written authorization. Purchaser shall pay Seller its normal charges for service and parts for any inspection, repair or replacement that falls outside the warranty set forth in Section 10.1. Seller's warranty does not apply to consumable materials, disposables, supplies, accessories and collateral equipment, except as specifically stated in writing or as otherwise set

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forth in the Product Warranty attached hereto and incorporated herein by reference, nor to products or parts thereof supplied by Purchaser.

10.3 This warranty is made on condition that immediate written notice of any noncompliance be given to Seller and Seller's inspection reveals that Purchaser's claim is covered under the terms of the warranty (i.e., that the noncompliance is due to traceable defects in original materials and/or workmanship).

10.4 Purchaser shall provide Seller with both on-site and remote access to the Products. The remote access shall be provided through the Purchaser's network as is reasonably necessary for Seller to provide warranty services under this Agreement. Remote access will be established through a broadband internet-based connection to either a Purchaser owned or Seller provided secure end-point. The method of connection will be a Peer-to-Peer VPN IPsec tunnel (non-client based) with specific inbound and outbound port requirements.

10.5 Warranty service will be provided without charge during Seller's regular working hours (8:30-5:00), Monday through Friday, except Seller's recognized holidays. If Purchaser requires that service be performed outside these hours, such service can be made available at an additional charge, at Seller's then current rates. The obligations of Seller described in this section are Seller's only obligations and Purchaser's sole and exclusive remedy for a breach of product warranty.

10.6 SELLER MAKES NO WARRANTY OTHER THAN THE ONE SET FORTH HEREIN AND IN THE ATTACHED PRODUCT WARRANTY COVERING THE APPLICABLE PRODUCT CATEGORY. SUCH WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSES, AND SUCH CONSTITUTES THE ONLY WARRANTY MADE WITH RESPECT TO THE PRODUCTS AND ANY DEFECT, DEFICIENCY OR NONCONFORMITY IN ANY PRODUCT, SERVICE OR OTHER ITEM FURNISHED UNDER THIS AGREEMENT.

10.7 In the event of any inconsistencies between the terms of this Section 10 and the terms of the attached Product Warranty, the terms of the attached Product Warranty shall prevail.

11. LIMITATION OF LIABILITY

11.1 In no event shall Seller's liability hereunder exceed the actual loss or damage sustained by Purchaser, up to the purchase price of the Products. The foregoing limitation of liability shall not apply to claims for bodily injury or damages to real property or tangible personal property to the extent arising from Seller's negligence or a product defect.

11.2 SELLER SHALL NOT BE LIABLE FOR ANY LOSS OF USE, REVENUE OR ANTICIPATED PROFITS; COST OF SUBSTITUTE PRODUCTS OR SERVICES; LOSS OF STORED, TRANSMITTED OR RECORDED DATA; OR FOR ANY INDIRECT, INCIDENTAL, UNFORESEEN, SPECIAL, PUNITIVE OR CONSEQUENTIAL DAMAGES WHETHER BASED ON CONTRACT, TORT (INCLUDING NEGLIGENCE), STRICT LIABILITY OR ANY OTHER THEORY OR FORM OF ACTION, EVEN IF SELLER HAS BEEN ADVISED OF THE POSSIBILITY THEREOF, ARISING OUT OF OR IN CONNECTION WITH THIS AGREEMENT OR THE SALE OR USE OF THE PRODUCTS. THE FOREGOING IS A SEPARATE, ESSENTIAL TERM OF THIS AGREEMENT AND SHALL BE EFFECTIVE UPON THE FAILURE OF ANY REMEDY, EXCLUSIVE OR NOT.

12. INSTALLATION - ADDITIONAL CHARGES

12.1 General. Unless otherwise expressly stipulated in writing, the Products covered hereby shall be installed by and at the expense of Seller except that Seller shall not provide rigging or site preparation services unless otherwise agreed to in writing by Seller for an additional charge. Seller will not install accessory items such as cabinets, illuminators, darkroom equipment or processors for X-Ray and CT equipment, unless otherwise agreed to in writing by Seller.

12.2 Installation by Seller. If Seller specifies it will install the Products, the following applies: subject to fulfillment of the obligations set forth in Section 12.4 below, Seller shall install the Products and connect them to the requisite safety switches and power lines to be installed by Purchaser. Except as otherwise specified below, if such installation and connection are performed by Seller's technical personnel, prices shown include the cost thereof, provided that the installation and connection can be performed within the Continental United States or Puerto Rico and during normal business hours. Any overtime charges or other special expenses shall be additional charges to the prices shown.

12.3 Trade Unions. In the event that a trade union, or unions, or other local labor conditions prevent Seller from performing the above work with its own employees or contractors, then Purchaser shall either make all required arrangements with the trade union, or unions, to permit Seller to complete the work or shall provide the personnel, at Purchaser's sole cost and expense. Moreover, any additional cost incurred by Seller and related to such labor disputes shall be paid by the Purchaser and Seller's obligations under such circumstances will be limited to providing engineering supervision of installation and connection of the Products to existing wiring.

12.4 Purchaser's Obligations. Purchaser shall, at its expense, provide all proper and necessary labor and materials for plumbing service, carpentry work, conduit wiring, and other preparations required for such installation and connection. All such labor and materials shall be completed and available at the time of delivery of the Products by Seller. Additionally, Purchaser shall provide free access to the installation site and, if necessary, safe and secure space thereon for storage of Products and equipment prior to installation by Seller. Purchaser shall be responsible, at its sole cost and expense, for obtaining all permits, licenses and approvals required by any federal, state or local authorities in connection with the installation and operation of the Products, including but not limited to any certificate of need and zoning variances. Purchaser shall provide a suitable environment for the Products and shall ensure, at its sole cost and expense, that its premises are free of asbestos, hazardous conditions and any concealed, unknown or dangerous conditions and that all site requirements are met. Seller shall delay its work until Purchaser has completed the removal of any asbestos or other hazardous materials or has taken any other precautions and completed any other work required by applicable regulations. Purchaser shall reimburse Seller for any increased costs and expenses incurred by Seller that are the result of or are caused by any such delay. In the event that Seller is requested to supervise the installation of the Products, it remains the Purchaser's responsibility to comply with local regulations. Seller is not an architect and all drawings furnished by Seller are not construction drawings.

12.5 Regulatory Reporting. In the event that any regulatory activity is performed by anyone other than Seller's authorized personnel, then Purchaser shall be responsible for fulfilling any and all reporting requirements.

12.6 Completion of Installation. Installation shall be complete upon the conclusion of final calibration and checkout under Seller's standard procedures to verify that the Products meet applicable written performance specifications. Notwithstanding the foregoing, first use of the Products by Purchaser, its agents or employees for any purpose after delivery shall constitute completion of installation.

13. PATENT, COPYRIGHT AND OTHER INFRINGEMENT CLAIMS

13.1 Infringement by Seller. Seller warrants that the Products manufactured by Seller and sold hereunder do not infringe any U.S. patent or copyright. If Purchaser receives a claim that any such Products, or parts thereof, infringe upon the rights of others under any U.S. patent or copyright, Purchaser shall notify Seller immediately in writing. As to all infringement claims relating to Products or parts manufactured by Seller or one of its affiliates:

(a) Purchaser shall give Seller information, assistance and exclusive authority to evaluate, defend and settle such claims.

(b) Seller shall then, at its own expense, defend or settle such claims, procure for Purchaser the right to use the Products, or remove or modify them to avoid infringement. If none of these alternatives is available on terms reasonable to Seller, then Purchaser shall return the Products to Seller and Seller shall refund to Purchaser the purchase price paid by Purchaser less reasonable depreciation for Purchaser's use of the Products. The foregoing states Seller's entire obligation and liability, and Purchaser's sole remedy, for claims of infringement.

13.2 Infringement by Purchaser. If some or all of the Products sold hereunder are made by Seller pursuant to drawings or specifications furnished by Purchaser, or if Purchaser modifies or combines, operates or uses the Products other than as specified by Seller or with any product, data, software, apparatus or program not provided or approved by Seller, then the indemnity obligation of Seller under Section 13.1 shall be null and void and should a claim be made that such Products infringe the rights of any third party under patent, copyright or otherwise, then Purchaser shall indemnify, defend and hold Seller harmless against any liability or expense, including reasonable attorneys' fees, incurred by Seller in connection therewith.

14. DESIGNS AND TRADE SECRETS; LICENSE; CONFIDENTIALITY

14.1 Any drawings, data, designs, software programs or other technical information supplied by Seller to Purchaser in connection with the sale of the Products are not included in the sale of the Products to Purchaser, shall remain Seller's property and shall at all times be held in confidence by Purchaser. Such information shall not be reproduced or disclosed to others without Seller's prior written consent.

14.2 For all goods purchased hereunder which utilize software for their operation, such "Applications Software" shall be licensed to Purchaser under the terms of Seller's Software License Schedule attached hereto.

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14.3 Diagnostic/Maintenance Software is not included under Section 14.2 above, is available only as a special option under a separate Diagnostic Materials License Agreement, and may be subject to a separate licensing fee.
14.4 Seller and Purchaser shall maintain the confidentiality of any information provided or disclosed to the other party relating to the business, customers and/or patients of the disclosing party, as well as this Agreement and its terms (including the pricing and other financial terms under which the Purchaser will be purchasing the Products). Each party shall use reasonable care to protect the confidentiality of the information disclosed, but no less than the degree of care it would use to protect its own confidential information, and shall only disclose the other party's confidential information to its employees and agents having a need to know this information. The obligations of confidentiality set forth herein shall not apply to any information in the public domain at the time of disclosure or that is required to be disclosed by court order or by law.

15. ENGINEERING CHANGES
15.1 Seller makes no representation that engineering changes which may be announced in the future will be suitable for use on, or in connection with, the Products.

16. ASSIGNMENT
16.1 Neither party may assign any rights or obligations under this Agreement without the prior written consent of the other and any attempt to do so shall be void, except that Seller may assign this Agreement without consent to any subsidiary or affiliated company, and may delegate to authorized subcontractors or service suppliers any work to be performed under this Agreement so long as Seller remains liable for the performance of its obligations under this Agreement. This Agreement shall inure to and be binding upon the parties and their respective successors, permitted assigns and legal representatives. Seller shall have no obligations under this Agreement to any assignee of Purchaser that is not approved by Seller in advance.

17. COSTS AND FEES
17.1 In the event that any dispute or difference is brought arising from or relating to this Agreement or the breach, termination or validity thereof, the prevailing party shall be entitled to recover from the other party all reasonable attorneys' fees incurred, together with such other expenses, costs and disbursements as may be allowed by law.

18. MODIFICATION
18.1 This Agreement may not be changed, modified or amended except in writing signed by duly authorized representatives of the parties.

19. GOVERNING LAW; WAIVER OF JURY TRIAL
19.1 This Agreement shall be governed by the laws of the Commonwealth of Pennsylvania.
19.2 EACH OF THE PARTIES EXPRESSLY WAIVES ALL RIGHTS TO A JURY TRIAL IN CONNECTION WITH ANY DISPUTE UNDER THIS AGREEMENT.

20. COST REPORTING
20.1 Purchaser agrees that it will fully and accurately account for and report in all cost reports and otherwise fully and accurately disclose to federal and state health care program payors and fully and accurately reflect where and as appropriate to the applicable reimbursement methodology, all services and other items, including any and all discounts, received from Seller under this Agreement, in compliance with all applicable laws, rules and regulations, including but not limited to the Social Security Act and implementing regulations relating to Medicare, Medicaid and other federal and state health care reimbursement programs.

21. INTEGRATION
21.1 These terms and conditions, including any attachments or other documents incorporated by reference herein, constitute the entire agreement and the complete and exclusive statement of agreement with respect to the subject matter hereof, and supersede any and all prior agreements, understandings and communications between the parties with respect to the Products.

22. SEVERABILITY; HEADINGS
22.1 No provision of this Agreement which may be deemed unenforceable will in any way invalidate any other portion or provision of this Agreement. Section headings are for convenience only and will have no substantive effect.

23. WAIVER
23.1 No failure and no delay in exercising, on the part of any party, any right under this Agreement will operate as a waiver thereof, nor will any single or partial exercise of any right preclude the further exercise of any other right.

24. NOTICES
24.1 Any notice or other communication under this Agreement shall be deemed properly given if given in writing and delivered in person or mailed, properly addressed and stamped with the required postage, to the intended recipient at its address specified on the face hereof. Either party may from time to time change such address by giving the other party notice of such change in accordance with this section.

25. RIGHTS CUMULATIVE
25.1 The rights and remedies afforded to Seller under this Agreement are in addition to, and do not in anyway limit, any other rights or remedies afforded to Seller by any other agreement, by law or otherwise.

26. END USER CERTIFICATION
26.1 Purchaser represents, warrants and covenants that it is acquiring the Products for its own end use and not for reselling, leasing or transferring to a third party (except for lease-back financings).

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Software License Schedule
to the Siemens Medical Solutions USA, Inc. General Terms and Conditions

1. DEFINITIONS: The following definitions apply to this Schedule:
"**Agreement**" shall mean the attached (i) Quotation for Products and/or Services including the Terms and Conditions of Sale and applicable schedules; and/or (ii) Software License Agreement describing the software licensed herein and the specific system for which the license is issued.
"**Licensor**" shall mean Siemens Medical Solutions USA, Inc.
"**Licensee**" shall mean the end-user to whom Licensor provides Software or Documentation for its internal use under the Agreement.
"**Software**" shall mean the software described in the attached Agreement, including the following as contained therein: (i) software programs consisting of a series of statements or instructions to be used directly or indirectly in a programmable controller or computer to bring about a certain result and (ii) databases consisting of systemized collections of data to be used or referenced directly or indirectly by a programmed controller or computer. Notwithstanding the foregoing, "Software" does not include "firmware" as such term is conventionally understood. Diagnostic/Maintenance Software also is not included within the scope of the Software licensed under this Schedule, and is available only as a special option under a separate Diagnostic Materials License Agreement and may be subject to a separate licensing fee.
"**Documentation**" shall mean the documents and other supporting materials which are intended to support the use of an associated product, including (but not limited to) instructions, descriptions, flow charts, logic diagrams and listings of the Software, in text or graphic form, on machine readable or printed media.
"**Designated Unit**" shall mean a single control unit or computer identified on the first page of the Agreement, on which Software licensed hereunder may be used by Licensee.
2. SCOPE: The following terms and conditions shall apply to all Software and Documentation provided by Licensor to Licensee under the Agreement (whether included with other products listed in the Agreement or listed separately in the Agreement), together with any updates or revisions thereto which Licensor may provide to Licensee, and all copies thereof, except any Software and/or Documentation licensed directly by Licensor's supplier under a separate end-user license agreement accompanying the Software or the Documentation, in which case Licensee agrees to be bound by that license agreement as a condition to using the Software and/or Documentation. Except as expressly provided herein, and provided that in no event shall the warranties or other obligations of Licensor with respect to such Software or Documentation exceed those set forth in this Schedule, this Schedule shall be subject to the liability limitations and exclusions and other terms and conditions set forth in the Agreement. **ANY USE OF THE SOFTWARE, INCLUDING BUT NOT LIMITED TO USE ON THE DESIGNATED UNIT, WILL CONSTITUTE LICENSEE'S AGREEMENT TO THIS SOFTWARE LICENSE SCHEDULE (OR RATIFICATION OF ANY PREVIOUS CONSENT).**
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5. UPDATES AND REVISIONS: During the warranty period or under a separate service contract or software update subscription, revised or updated versions of the Software licensed under this Schedule may be made available, at Licensor's option, to Licensee to use or to test while Licensee continues use of a previous version. Licensee has the right to decide whether to install any such revised or updated versions or to continue use of the previous version after giving due regard to the United States Food and Drug Administration rules and regulations. However, Licensee shall pay Licensor for any services necessitated by any modifications of the Software by Licensee or by Licensee's failure to utilize the current non-investigational version of the Software provided by Licensor. Software updates that provide new features or capabilities or that require hardware changes will be offered to Licensee at purchase prices established by Licensor. Licensor retains the sole right to determine whether an update represents an enhancement of a previously purchased capability or a new capability for which the Licensee will be charged. In addition, some updates may require Applications Training performed by Licensor's personnel that will be offered at Licensor's prevailing rates. Licensor retains the sole right to determine whether an update requires such training.

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(c) The Software may contain support for programs written in Java. Java technology is not fault tolerant and is not designed, manufactured, or intended for use or resale as online control equipment in hazardous environments requiring fail-safe performance, such as in the operation of nuclear facilities, aircraft navigation or communication systems, air traffic control, direct life support machines, or weapons systems, in which the failure of Java technology could lead directly to death, personal injury, or severe physical or environmental damage. Sun Microsystems, Inc. has contractually obligated Licensor's supplier to make this disclaimer.

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TRADE-IN EQUIPMENT REQUIREMENTS

THE FOLLOWING APPLIES ONLY TO THE EXTENT THAT THE QUOTATION INCLUDES AN EQUIPMENT TRADE-IN. THESE REQUIREMENTS ARE IN ADDITION TO ANY OTHER REFERENCED TERMS AND CONDITIONS ON THE QUOTATION AND SHALL REMAIN IN EFFECT REGARDLESS OF ANY CONTRARY LANGUAGE IN THE QUOTATION.

This Quotation includes the trade-in equipment described herein and referenced by either the Project Number identified in the Quotation hereof (non-Ultrasound) or the Trade Allowance Part Number (Ultrasound) as further described in the associated Trade Sheet which is incorporated herein by reference. Purchaser certifies that the description of the trade-in equipment as set forth on the Trade Sheet is a true and accurate representation of the equipment, and that the equipment is in good working condition unless otherwise noted on the Trade Sheet.

The trade-in equipment must be made available for removal no later than turnover of the new equipment. Purchaser must vacate the room of all items not listed on the Trade Sheet, or otherwise clearly identify all items listed on the Trade Sheet, prior to the start of the de-installation. If this is not done, Seller will have no liability for items which are subsequently removed or scrapped. If the de-installation or return of the trade-in equipment is delayed by Purchaser for reasons other than a force majeure event, or if upon inspection by Seller it is determined that the equipment does not meet the manufacturer's operating specifications, or if any items listed as included on the Trade Sheet are not made available at the time of de-installation, then trade-in value will be re-evaluated and any loss in value or additional costs incurred by Seller shall be deducted from the established trade-in value and the pricing set forth on this Quotation will be adjusted by change order. In the event that access to the trade-in equipment is denied past 14 days post-turnover, then Purchaser shall pay to Seller a rental fee in the amount 10% of the total trade-in value plus any additional value provided by an Elevate/Promotional program included in this Quotation (no less than $1000) for each month, or part thereof, that access is denied. In addition, if the purchase and installation of the new equipment covered by this Quotation is not completed, then Seller shall invoice Purchaser for all costs and expenses incurred by Seller in connection with the de-installation and removal of the trade-in equipment, including but not limited to labor, materials, rigging out, and transportation, which costs shall be paid by Purchaser within thirty (30) days of the invoice date.

Purchaser further acknowledges and agrees that (i) the trade-in equipment will be free and clear of all liens and encumbrances including, but not limited to, unpaid leases and loans, and that upon request, it will execute a bill of sale or other documents reasonably satisfactory to Siemens to transfer title and ownership of the equipment to Seller, (ii) it is Purchaser's sole responsibility to delete all protected health information and any other confidential information from the equipment prior to de-installation, without damaging or cannibalizing the equipment or otherwise affecting the operation of the equipment in accordance with its specifications, (iii) the equipment, including all updates, upgrades, modifications, enhancements, revisions, software, S/W disks and manuals, shall be returned to Siemens in good operating condition, reasonable wear and tear excepted, and (iv) to the extent not prohibited by applicable law, Purchaser shall indemnify and hold Seller harmless from and against any and all claims, demands, causes of action, damages, liability, costs and expenses (including reasonable attorney's fees) resulting or arising from Purchaser's failure to comply with item (i) above.

FOR MR SYSTEMS: cryogen levels must be least 75% upon time of de-installation. FOR MOBILE SYSTEMS: system must be road worthy and a state issued title transferring ownership to Seller must be received by Seller prior to the removal of the mobile system. FOR MODALITY TRADE SYSTEMS (non-Ultrasound): The trade-in equipment must be available for inspection within two weeks of the scheduled de-installation date. In addition, Purchaser must provide a clear path for the removal of the trade-in equipment. Any additional costs due to the need to use a larger rig (other than a standard 80 ton rig), as well as any construction activities, street closings, permits, etc., required to de-install/remove the equipment are out-of-scope costs and will be the responsibility of Purchaser.

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MR Warranty Information

Product (New Systems and "Proven Excellence" Refurbished Systems Only)	Period of Warranty[1]	Coverage
MR System (not including consumables)	12 month	Full Warranty (parts & labor)
Post Warranty (after expiration of system warranty) – Replacement parts only!		
Magnet	12 month	Parts only
Spare Parts	6 month	Parts only
Consumables	Not Covered	

Note: Optional extended warranty coverage can be obtained by purchase of a service agreement.

[1] Period of warranty commences from the date of first use or completion of installation, whichever occurs first. In the event the completion of installation is delayed for reasons beyond Siemens' control, the stated warranty period shall commence 60 days after delivery of equipment.

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Detailed Technical Specifications

MAGNETOM Aera - USA

Part No. / Product	Description
14416900 MAGNETOM Aera - System	**Aera ex Erlangen ENS_14416900** MAGNETOM Aera - the first 1.5T Tim+Dot system - integrates the next generation Tim - Tim 4G and the Siemens unique Dot Engines (Day Optimizing Throughput Engines) enabling workflow efficiency combined with higher diagnostic confidence due to consistent results. The system includes: **Tim 4G+Dot** Tim 4G provides increased patient comfort and optimized workflow efficiency. Only one patient setup, no repositioning, and no changing of coils. Ultra-light-weighted coils with high density of coil elements for maximized patient comfort and increased SNR. Feet-first positioning for almost all examinations possible reduces claustrophobia. Tim 4G is 4G flexibility, accuracy and speed and brings image quality and acquisition speed to a new level. Dot helps to take away the complexity in MRI scanning through patient personalization, user guidance and process automation. Optimized scan strategies are provided and can be selected based on patient condition, which allows for high quality exams even when conditions change. Integrated decision points allow the user to easily add or remove one or a group of protocols with one click. Step by step real-time on board guidance guides novice users even through the most complicated exams. Process automation allows optimal timing for breathing, scanning, and planning. Dot can be easily customized to follow the individual standards of care. Dot is personalized, guided and automated and designed to improve workflow efficiency and image consistency. MAGNETOM Aera with its 70 cm Open Bore design and a system length of only 145 cm gives a patient friendly appearance that can significantly help patients with anxiety or claustrophobia. **Magnet:** - Ultra-short 137 cm long (145 cm with covers), whole-body superconductive 1.5T magnet with active shielding (AS) technology with counter coils - External Interference Shielding (E.I.S.) - Excellent homogeneity enabled by TrueForm magnet design which allows for a cylindrically optimized homogeneity volume resulting in higher image quality (50 × 50 × 45 cm^3 DEV, typ. 3.6 ppm based on the 24-plane plot method) - The magnet has a helium capacity of approximately 1,280 liters and a typical Helium boil-off rate of 0 l/yr during typical, undisturbed clinical operation depending on the sequences used and examination time, and provided the system is serviced in regular intervals. - It has an integrated magnet cooling system. **Gradient system:** - Actively shielded water-cooled world-class gradient system - True Form Gradient Design - All axes force compensated **DirectRF - RF Transmit/Receive System:** - Fully integrated Transmit and Receive path in the magnet housing including extremely compact water-cooled solid state amplifier with 26.1 kW peak power - High dynamic range - Immediate feedback loop for real-time sequence adaptation - Integrated no tune transmit/receive Body Coil - The revolutionary Tim 4G technology allows connecting up to 204 coil elements simultaneously enabling higher SNR and iPAT in all directions. No repositioning of patients is needed even for large Field of View

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Part No. / Product	Description
(Continued) **14416900** **MAGNETOM Aera - System**	examinations. - Dual-Density Signal Transfer enables ultra-high density coil design by integrating key RF components into the local coil. **Tim 4G Coils**: The new Tim 4G coil technology with Dual-Density Signal Transfer, DirectConnect and SlideConnect Technology combines key imaging benefits: Excellent image quality, high patient comfort, and unmatched flexibility. The Tim 4G coils are designed for highest image quality combined with easy handling. The high element density of the coils increases SNR and reduces examination times. DirectConnect and SlideConnect™ technology reduce patient set up time significantly. The coils are designed with the patient in mind. Light weighted coils and open design ensure highest patient comfort which results in better patient cooperation and image quality. No coil changing with multi-exam studies saves patient setup- and table time. AutoCoilSelect enables dynamic, automatic, or interactive selection of the coil elements within the Field of View and speeding the exam preparation at the host. All coils are time-saving "no-tune" coils. A comprehensive set of pads for comfortable and stable patient positioning together with safety straps are included. - Head/Neck 20 The 20-channel coil with its 20 integrated pre-amplifiers ensures excellent signal-to-noise ratio. The unique DirectConnect technology allows users connecting the 20 coil elements of the Head/Neck20 without cables. The patient friendly open design allows for maximum patient comfort which is supported in addition by a look-out mirrow for claustrophobic patients. The high channel coil is iPAT compatible in all directions. The open and light design of the upper coil part increases patient comfort and is removable for easy patient handling. The lower coil part may remain on the table for most of the examinations can be used without the upper part .The Head/Neck 20 and Spine 32 are smoothly integrated into the patient table, thus enabling high flexibility in imaging and fewer coil changes and easy handling when switching patients. The Head /Neck 20 coil is equipped with two removable cushioned head stabilizers for stable and comfortable patient positioning. The Head/ Neck 20 can be used for applications like head examinations, neck examinations, MR Angiography, combined head/neck examinations or for imaging of the TMJ (temporomandibular joints). Typically combined with the Spine 32 and Body 18 or Peripheral Angio 36 but also other combinations eg with flexible coils like the Flex Large 4 are possible. - Body 18 The 18-channel coil with its 18 integrated pre-amplifiers ensures maximum signal-to-noise ratio. The 18 coil elements of the Body 18 with only one SlideConnect Plug allows for fast and easy patient preparation resulting in less table time. Fast acquisition times enabled by iPAT in all directions. The light-weighted coil ensures highest patient comfort. Body 18 operates in an integrated fashion with the Spine 32 as a 30 channel body coil Body 18 can be combined with further Body 18 coils for larger coverage and positioned in different orientations (0°, 90°, 180°, 270°) for patient specific adaptations The Body 18 is typically used in combination with the Spine 32 for examinations of the thorax, abdomen, pelvis or hip and operates as a 30 channel body coil (3 rings 10 elements).The Body 18 can also be used for cardiac or vascular applications. Through its perfect combinability with the Spine 32, further Body 18 (optional), the Peripheral Angio 36 (optional), but also the Head/Neck20 and all flexible coils (e.g. Flex Large 4, Flex Small 4) it contributes for a broad range of indications up to whole-body imaging. - Spine 32 The 32-channel coil with its 32 integrated pre-amplifiers ensures maximum signal-to-noise ratio. The unique DirectConnect technology allows connecting the 32 coil elements of the Spine 32 without the need to plug in any cable. The patient friendly ergonomic design allows for maximum patient comfort. The high element coil is iPAT compatible in all directions. Smoothly integrated into the patient table the Spine 32 may remain on the patient table for nearly all exams. The Spine 32 is typically combined with Body 18, Head/Neck 20, Peripheral Angio 36 or Flex Large 4, Flex

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Part No. / Product	Description
(Continued) **14416900** **MAGNETOM Aera - System**	Small 4. - Flex Large 4/ Flex Small 4 Light-weighted, very flexible, iPAT compatible, 4-element no-tune receiver coils which are made of soft and smooth material. The coils can be wrapped around or used flat. Both coils can be connected via Flex Coil interface. One Flex Coil interface is already delivered as standard. The coils can be used for different examinations ranging from examinations of the extremities to abdominal examinations. **TimTable** - The maximum scan range of the Tim Table is 140 cm. A scan range of 205 cm can be achieved with the Tim Whole Body suite (optional) - The maximum patient weight of 250 kg (550 lbs) is valid for horizontal and vertical movements, which ensures maximized patient comfort for obese patients. - The patient table can be lowered to a minimum height of 52 cm from the floor, for easier patient positioning and better accessibility for geriatric, pediatric or immobile patients. An infusion stand is integrated to ensure fast patient set up also for critical patients. - Multiple Tim4G coils can be connected at once for efficient and patient friendly examinations. - The Tim Table can be moved with two clicks into the isocenter - one click to the upmost position and one click into the isocenter. **Dot (Day Optimizing Throughput) Engine** Dot multiplies the power of Tim resulting in greater image consistency and diagnostic confidence **Dot Control Centers and Dot Display** - The ergonomically designed Dot Control Centers are integrated left and right into the front covers for controlling table movement and interaction with the Dot Display. The Dot Control Centers are well illuminated for easy visual recognition. - Automated table move up to upmost position, to center position or Home position facilitate smooth patient preparation and will reduce table time - Variable (6 levels) ventilation and lighting inside the magnet bore or volume adjustments are possible for increased patient comfort - The Dot Display provides on board guidance for patient set up where it's needed - directly at the scanner. Information such as Patient name or exam type or required patient position, guidance for ECG set up and immediate visualization of physiological curves will be provided for convenient operation. - Almost all table control functions, including ventilation and illumination of the magnet bore, can be also controlled from the operator console for convenient operation. **Dot Technology** Dot makes it easy to get the best possible results for virtually any type of patient. Dot gives uniquely tailored, optimized scans configurable to patient condition or clinical question. Dot provides patient personalization, user guidance and process automation and is of course configurable by the user to adapt to the different clinical needs and standards of care. **Brain Dot Engine** The Brain Dot Engine simplifies general brain examinations with guided and automated workflows customized to the site specific standards of care. The Brain Dot Engine supports the user in achieving reproducible image quality with increased ease of use and time efficient exams. The brain workflow can be personalized to the individual patient condition and clinical need. Several predefined strategies are included, which can be easily selected with one click. They can be changed at any time during the brain workflow. Protocols tailored for use of contrast media are integrated. - Standard: Standard examination with 2D protocols - Resolution focus: Examination with 3D protocols (with e.g. SPACE) for detailed views - Speed focus: Examination with fast 2D protocols (with e.g. HASTE) for further speeding up the exam - Limited patient capabilities: Examination with *syngo* BLADE protocols - to minimize and correct for the effects of motion automatically

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Part No. / Product	Description

(Continued)
14416900
MAGNETOM Aera - System
	Step-by-step user guidance is seamlessly integrated. Example images and guidance text are displayed for each individual step of the scanning workflow. Both - images and text - are easily configurable by the user.
	
	Easy positioning of the patient with AutoPosition. The patient is automatically placed at the isocenter without any laser marking required.
	
	AutoAlign Head allows automatically slice positioning and aligns on the anatomically derived sagittal, coronal, and axial slices of the localizer. The operator-free alignment and anatomical marking are consistent, independently of patient age, head position, or disease.
	
	Automatic real-time calculation of trace-weighted images and ADC maps with Inline DiffusionTechnology.
	
	Easy rerun or repeat with functionality allows for reduced table time even in case of patients with pain or claustrophobia. An image inside the examination UI can be selected and a rerun of the corresponding series can be triggered with identical sequences or parameters. Alternatively an exam can be repeated with a changed strategy.
	
	The Brain Dot Engine as all Dot Engines can be modified by the user to their individual standard of care.
	
	Tim Application Suite
	The Tim Application Suite offers a complete range of clinically optimized sequences, protocols and workflow functionalities for all body regions. Excellent head-to-toe imaging can be accomplished with the sequences and features included in this application suite. To enable this comprehensive application range, nine dedicated application packages have been included.
	
	- Neuro Suite
	- Angio Suite
	- Cardiac Suite
	- Body Suite
	- Onco Suite
	- Breast Suite
	- Ortho Suite
	- Pediatric Suite
	- Scientific Suite
	
	Neuro Suite
	Comprehensive head and spine examinations can be performed with dedicated programs. High resolution protocols and fast protocols for uncooperative patients are provided. The Neuro Suite also includes protocols for diffusion imaging, perfusion imaging, and fMRI. It includes for example:
	- EPI sequences and protocols for diffusion, perfusion and fMRI for advanced neurological applications. Diffusion weighted imaging is possible with up to 16 b-values in the orthogonal directions. Dynamic Analysis software (included in standard configuation) enables calculation of:
	  - ADC maps
	  - t-test maps from the EPI images for fMRI
	  - Time-to-Peak maps for perfusion analysis.
	- Whole spine protocols acquire in multiple steps via software controlled table movement in a single click.
	- 3D isotropic resolution volume imaging using T1 3D MPRAGE / 3D FLASH, SPACE DarkFluid, T2 SPACE and 3D TSE
	- T2-weighted high resolution 3D Restore protocols optimized for inner ear examinations
	- Whole-spine protocols in multiple steps with software controlled table movement
	- 2D and 3D MEDIC protocols for T2-weighted imaging, particularly for C-spine examinations in axial orientation where reproducibility is difficult due to CSF pulsations and blood flow artifacts
	- 3D Myelograms with 3D HASTE and 3D True-FISP for anatomical details
	- Dynamic sacro-iliac joint imaging after contrast administration using a fast T1-weighted FLASH 2D sequence
	- Spine diffusion protocols to differentiate osteoporosis versus tumor infiltration and post-radiotherapy changes versus residual tumor with PSIF sequence

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Part No. / Product	Description
(Continued) **14416900** **MAGNETOM Aera - System**	- Precision filter for high spatial accuracy e.g. for neuro intra-operative imaging and stereotactic planning - 3D CISS (Constructive Interference in Steady State) for excellent visualization of fine structures such as cranial nerves. High resolution imaging of inner ear and spine - AutoAlign Head LS providing a fast, easy, standardized, and reproducible patient scanning supporting reading by delivering a higher and more standardized image quality **Angio Suite** Excellent MR Angiography can be performed to visualize arteries and veins with or without contrast agent. *Contrast-enhanced MRA* - 3D contrast-enhanced MRA protocols for e.g. single step, dynamic, peripheral, whole body MRA with the shortest TR and TE. The strong gradients make it possible to separate the arterial phase from the venous phase. - TestBolus workflow for optimized bolus timing and superb image quality. - CareBolus functionality for accurate determination of the bolus arrival time and the "Stop and Continue" of the 3D ce-MRA protocol after the 2D bolus control scan. - Dynamic ce-MRA for 3D imaging over time. *Non-contrast-MRA and venography* - 2D and 3D Time-of-Flight (ToF) protocols for MRA for the Circle of Willis, carotids, neck vessels, and breath-hold protocols for abdominal vessels - Triggered 2D ToF sequences for non-contrast MRA, particularly of the abdomen and the extremities - 2D/3D Phase-Contrast - MR venography with 2D/3D Time-of-Flight (ToF) and Phase-Contrast - TONE (Tilted Optimized Non-saturation Excitation) and MTC (Magnetization Transfer Contrast) techniques for improved Contrast-to-Noise Ratio (CNR) *Image processing tools* - MPR, MIP, MinIP, and 3D SSD - Inline MIP for immediate results - Inline subtraction of pre- and post-contrast measurements - Inline standard deviation maps of Phase-Contrast measurements for delineation of arteries and veins **Cardiac Suite** The cardiac suite covers comprehensive 2D routine cardiac applications, ranging from morphology and ventricular function to tissue characterization. Featuring *syngo* BEAT 2D in conjunction with iPAT and T-PAT techniques. *Cardiac views* - Fast acquisition of the basic cardiac orientations for further examination planning - Cardiac scouting provides users with a step-by-step procedure for the visualization and planning of typical cardiac views, e.g. based on TrueFISP or Dark Blood TurboFLASH: short axis, 4-chamber and 2-chamber views. *syngo BEAT* - Unique tool for fast and easy cardiovascular MR imaging - E.g. 1 click change from FLASH to TrueFISP for easy contrast optimization - 1-click to switch arrhythmia rejection on / off - 1-click change from Cartesian to radial sampling to increase effective image resolution (e.g. in pediatric patients) and avoid folding artifacts in large patients *Visualization of structural cardiovascular pathologies with CMR - syngo BEAT* - Breath-hold and free breathing techniques for strong contrast between the blood and vascular structures. Dark Blood TSE and HASTE imaging are available for the structural evaluation of the cardiothoracic anatomy, including vessels or heart valves. Cine techniques (FLASH & TrueFISP) for high-resolution valve evaluation - Multiple contrasts such as T1- and T2-weighted imaging for use in diseases such as myocarditis (inflammation / hyperaemia), ARVD (fibrous-fatty degeneration) or acute myocardial infarction (edema) - Dark-blood TSE with motion compensation for high-quality vessel wall imaging in small or large vessels *Tools for rapid evaluation of left or right ventricular function* - Acquisition of a stack of short-axis slices (standard segmented FLASH, or advanced segmented TrueFISP) - Automatic adjustment of the acquisition window to the current heart rate - Use of the Inline ECG for graphical ECG triggering setup - Retrospective gating with cine sequences (TrueFISP, FLASH)

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Part No. / Product	Description
(Continued) **14416900** **MAGNETOM Aera - System**	- Protocols for whole-heart coverage - iPAT integration for highest temporal and spatial resolution - Real-time imaging in case the patient is not able to hold his breath *Dynamic imaging and tissue characterization with syngo BEAT* - Protocols for high-contrast and high-resolution tissue characterization - Protocols for stress and rest imaging with TrueFISP or TurboFLASH contrast support the acquisition of multiple slices with high resolution and arbitrarily adjustable slice orientation for each slice - T-PAT with mSENSE and GRAPPA for advanced parallel imaging provides fast high-resolution dynamic imaging - Segmented IR TrueFISP / FLASH with TI scout for optimization of tissue contrast - Advanced tissue characterization with 2D phase-sensitive IR (PSIR) sequences TrueFISP and FLASH contrast. Magnitude and phase-sensitive images with one acquisition - Simple: no adjustment of inversion time (TI) necessary with PSIR technique - Ungated single-shot PSIR imaging for tissue characterization under difficult conditions: free-breathing technique that can be applied even in case of arrhythmia Physiological Measurement Unit (PMU) - Wireless Physio Control - Synchronizes the measurement with the physiological cycles (triggering to minimize motion artifacts caused by cardiac and respiratory movements) - Wireless Sensors - Wireless Vector ECG / respiration and pulse sensors for physiologically synchronized imaging, rechargeable battery-powered - for optimized patient handling - Physiological Signals Display - ECG (3 channels) - Pulse - Respiration - External Trigger Input Display ECG Triggering: - Acquisition of multiple slices, e.g. of the heart, at different phases of the cardiac cycle - Excellent image quality by synchronizing data acquisition with cardiac motion - Peripheral Pulse Triggering: - Reduces flow artifacts caused by pulsatile blood flow - Excellent image quality by synchronizing data acquisition to the pulsatile blood flow - Respiratory Triggering: - Excellent image quality by synchronizing data acquisition with the respiratory motion - External Triggering: - Interface for trigger input from external sources (e.g. Patient Monitoring System) inside the examination room - Interface for trigger input from external sources (e.g. pulse generator, trigger sources for fMRI) outside the examination room - Optical trigger output for fMRI - Retrospective gating for ECG, peripheral pulse, and external trigger input **Breast Suite** MR imaging has proven a very high sensitivity for breast lesions and is the gold standard for the examination of silicone implants. Extremely high spatial and temporal resolution can be achieved in very short measuring times by using iPAT with GRAPPA. Excellent soft tissue differentiation, customized protocols (e.g. with fat saturation or water excitation or silicone excitation), as well as flexible multiplanar visualization allow for fast, simple and reproducible evaluation of MR breast examinations. This package includes: - Quantitative evaluation and fast analysis of the data with colorized Wash-in, Wash-out, Time-To-Peak, Positive-Enhancement-Integral, MIPtime and combination maps with Inline technology or for offline calculation

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Part No. / Product	Description
(Continued) **14416900** **MAGNETOM Aera - System**	- High-resolution 2D protocols for morphology evaluation - High-resolution 3D protocols covering both breasts simultaneously - Protocols to support interventions (fine needle and vacuum biopsies, wire localization) - Protocols for evaluating breasts with silicone implants - Automatic and manual frequency adjustment, taking into account the silicone signal - Detection of the silicone signal either to suppress the silicone signal, if the surrounding tissue is to be evaluated, or to suppress the tissue signal in order to detect an implant leakage - SPAIR - robust fat sat (robust fat suppression using an adiabatic frequency selective inversion pulse) - DIXON - 2-point Dixon with 3D VIBE, the following contrasts can be obtained: in-phase, opposed phase, fat and water image. - iPAT with GRAPPA for maximum resolution in short time - Inline subtraction and MIP display - Offline subtraction, MPR and MIP display - *syngo* REVEAL: diffusion imaging for breast exams - iPAT Extension allows bilateral 3D sagittal breast imaging with Fat Sat or Water excitation The Breast Suite also includes: ***syngo* VIEWS (Volume Imaging with Enhanced Water Signal)** - bilateral - both breasts are examined simultaneously - axial - the milk ducts are directly displayed - fat-saturated or water-excited - fat complicates clinical evaluation and is suppressed - near-isotropic 3D measurement - the same voxel size in all three directions for reconstruction in any slice direction - submillimeter voxel - highest resolution for precise evaluation **Body Suite** Body Suite covers your needs for clinical body applications. Ultrafast high resolution 2D and 3D protocols are provided for abdomen, pelvis, MR Colonography, MRCP, dynamic kidney, and MR Urography applications. Siemens unique 2D PACE technique makes body imaging easy allowing for multi-breath hold examinations as well as free breathing during the scans. Motion artifacts are greatly reduced with 2D PACE Inline technology. This package includes: - Free breathing 2D PACE applications with 2D/3D HASTE (RESTORE) and 2D/3D TSE (RESTORE) - Optimized fast single shot HASTE protocols and high-resolution 3D RESTORE protocols based on SPACE and TSE for MRCP and MR Urography examinations ***ABDOMEN:*** *2D:* - T1w (FLASH) breath-hold scans +/- Fat Sat (SPAIR, Q-FatSat, in-/opp-phase) - T2w (HASTE, TSE/BLADE, EPI) breath-hold scans +/- Fat Sat (SPAIR, FatSat, STIR) - T1w (TFL) triggered scans (2D PACE free breathing) in-/opp-phase - T2w (HASTE, TSE/BLADE, EPI) triggered scans (2D PACE free breathing) +/- Fat Sat (SPAIR,FatSat, STIR) as well as HASTE- and TSE-multi-echo - Optimized fast single shot HASTE protocols and high-resolution 3D RESTORE protocols based on SPACE and TSE for MRCP and MR urography examinations *3D:* - Dixon (VIBE 2pt-Dixon) breath-hold scans, following contrasts can be obtained: in-phase, opposed phase, fat and water image. - Dynamic (VIBE + Q-FatSat) protocols for best visualization of focal lesions with high spatial and temporal resolution - Colonography bright lumen with T2-weighted TrueFISP and dark lumen with T1-weighted VIBE ***PELVIS:*** - High-resolution T1w, T2w pelvic imaging (prostate, cervix) - Isotropic T2w SPACE 3D protocols for tumor search in the pelvis - Dynamic volume examinations with 3D VIBE - *syngo* REVEAL: diffusion imaging for liver and whole body exams

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Part No. / Product	Description
(Continued) **14416900** **MAGNETOM Aera - System**	**Onco Suite** MR imaging has an excellent advantage of soft tissue contrast, multi-planar capabilities and the possibility of selectively suppressing specific tissue e.g. fat or water. This helps visualize pathologies, particularly metastases. The Onco Suite features a collection of sequences as well as protocols and evaluation tools that guide through a detailed screening of clinical indications, such as in hepatic neoplasms. This package includes: - STIR TSE and HASTE, FLASH in-phase and opposed-phase protocols with a high sensitivity to metastases visualization - Dynamic imaging protocols for assessment of the kinetic behavior for lesion visualization and characterization - Quantitative evaluation and fast analysis of the data with colorized Wash-in, Wash-out, Time-To-Peak, Positive-Enhancement-Integral, MIPtime and combination maps with Inline technology or for offline calculation - Display and analysis of the temporal behavior in selected regions of interest with the included MeanCurve post-processing application. This includes the capability of using additional datasets as a guide for defining regions of interest even faster and easier than before. - *syngo* REVEAL: diffusion imaging for liver and whole body exams Dedicated prostate protocols for detection, localization, and staging of tumors and recurrences - *syngo* REVEAL (diffusion-weighted imaging) - Protocols with high temporal resolution allow time course evaluation based on pharmacokinetic modeling **OrthoSuite** Ortho Suite is a comprehensive collection of protocols for joint and spine imaging. MR imaging is especially suitable for avascular necrosis and internal derangements. The protocols included in this Suite can also be applied for imaging of tumors and infections. This package includes: - 2D TSE protocols for PD, T1 and T2-weighted contrast with high in-plane resolution and thin slices - 3D MEDIC, 3D TrueFISP protocols with water excitation for T2-weighted imaging with high in-plane resolution and thin slices - High resolution 3D VIBE protocol for MR arthrography (knee, shoulder and hip) - 3D MEDIC, 3D TrueFISP, 3D VIBE protocols with water excitation having high isotropic resolution, optimized for 3D post-processing - PD SPACE with fat saturation and T2 SPACE with high isotropic resolution optimized for 3D post-processing - Whole spine single-step or multi-step protocols - Excellent fat suppression in off-center positions, e.g. in the shoulder due to high magnet homogeneity - Dynamic TMJ and ilio-sacral joint protocol - Susceptibility-insensitive protocols for imaging in the presence of a prosthesis - Multi-Echo SE sequence with up to 32 echoes for the calculation of T2 time maps (calculation included in the Scientific Suite) - High resolution 3D DESS (Double Echo Steady State): T2 / T1-weighted imaging for excellent fluid-cartilage differentiation **Pediatric Suite** The parameters for pediatric imaging vary significantly in comparison to the parameters for adults. The reasons are developing tissues, body size, faster heart rates and restricted compliance with breath-hold commands. Protocols can be adapted for imaging infants. **Scientific Suite** Scientific Suite supports the scientifically oriented user with an easy access to application-specific data for further processing and advanced image computation methods. - Support of USB memory sticks - Access to the file system by means of a secure and convenient browser - Anonymization of patient data - Easy generation of AVIs and screenshots for integration into presentations and training videos - Export function for tables, statistics and signal-time-courses in a communal format (MeanCurve, Spectroscopy, DTI evaluation)

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Part No. / Product	Description
(Continued) **14416900** **MAGNETOM Aera - System**	- Advanced image computation methods such as T2 and T1 time calculation, addition, subtraction, multiplication, division, and integration of images The sequences, features and techniques for acquisition and reconstruction included in the Tim Application Suite are described in detail below. **Sequences** Spin Echo family of sequences: - Spin Echo (SE) - Single, Double, and Multi Echo (up to 32 echoes); Inversion Recovery (IR) - 2D / 3D Turbo Spin Echo (TSE) - Restore technique for shorter TR times while maintaining excellent T2 contrast; TurboIR: Inversion Recovery for STIR, DarkFluid T1 and T2, TrueIR; Echo Sharing for dual-contrast TSE - 2D / 3D HASTE (Half-Fourier Acquisition with Single Shot Turbo Spin Echo) - Inversion Recovery for STIR and DarkFluid contrast - SPACE for 3D imaging with high isotropic resolution with T1, T2, PD, and DarkFluid Contrast Gradient Echo family of sequences: - 2D / 3D FLASH (spoiled GRE) - dual echo for in- / opposed phase imaging 3D VIBE (Volume Interpolated Breathhold Examination) - quick fat saturation; double echo for in-phase / opposed phase 3D imaging; DynaVIBE: Inline 3D elastic motion correction for multi phase data sets of the abdomen; Inline Breast Evaluation - 2D / 3D MEDIC (Multi Echo Data Image Combination) for high resolution T2 weighted orthopedic imaging and excellent contrast - 2D / 3D TurboFLASH - 3D MPRAGE; single shot T1 weighted imaging e.g. for abdominal imaging during free breathing - 3D GRE for fi eld mapping - 2D / 3D FISP (Fast Imaging with Steady State Precession) - 2D / 3D PSIF - PSIF Diffusion - Echo Planar Imaging (EPI) - diffusion-weighted; single shot SE and FID e.g. for BOLD imaging and Perfusion-weighted imaging; 2D / 3D Segmented EPI (SE and FID) - ce-MRA sequence with Inline subtraction and Inline MIP - 2D / 3D Time-of-Flight (ToF) Angiography - single slab and multi slab; triggered and segmented - 2D / 3D Phase Contrast Angiography - *syngo* BEAT Tool - TrueFISP segmented; 2D FLASH segmented; - Magnetization-prepared TrueFISP (IR, SR, FS); IR TI scout; Retrogating Standard Fat/Water Imaging - Fat and Water Saturation. Additional frequency selective RF pulses used to suppress bright signal from fatty tissue. Two selectable modes: weak, strong - Quick FatSat - SPAIR: robust fat suppression for body imaging using a frequency selective inversion pulse - Fat / Water Excitation. Spectral selective RF pulses for exclusive fat / water excitation - Dixon technique for fat and water separation - based on VIBE (2 point Dixon) Standard Techniques - True Inversion Recovery to obtain strong T1-weighted contrast - Dark Blood inversion recovery technique that nulls fl uid blood signal - Saturation Recovery for 2D TurboFLASH, gradient echo, and T1-weighted 3D TurboFLASH with short scan time (e.g. MPRAGE) - Freely adjustable receiver bandwidth, permitting studies with increased signal-to-noise ratio - Freely adjustable flip angle. Optimized RF pulses for image contrast enhancement and increased signal-to-noise ratio - MTC (Magnetization Transfer Contrast). Off-resonance RF pulses to suppress signal from certain tissues, thus enhancing the contrast. Used e.g. in MRA - Argus viewer for reviewing cine studies• - Report Viewer for DICOM structured reports including report editing

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Part No. / Product	Description
(Continued) **14416900** **MAGNETOM Aera - System**	- Dynamic Analysis for addition, subtraction, division, standard deviation, calculations of ADC maps, T1 and T2 values, TTP, t-Test, etc. - Image Filter - 3D post-processing MPR, MIP, MinIP, SSD - Flexible film formats and paper print - Data storage of images and cine AVI fi les on CD / DVD with DICOM viewer as the viewing tool for hand out to the patients or referrals - Selectable centric elliptical phase reordering via the user interface - Multiple Direction Diffusion Weighting (MDDW) - perform diffusion tensor imaging with multiple diffusion weightings and up to 12 directions for generating data sets. - Inversion Recovery to nullify the signal of fat, fluid or any other tissue Standard techniques for Flow Artifact reductions - LOTA (LongTerm Data Averaging) technique to reduce motion and flow artifacts - Pre-saturation techniques using RF saturation pulses to suppress flow and motion artifacts - Tracking SAT bands maintain constant saturation of venous and/or arterial blood flow e.g. for 2D/3D sequential MRA - TONE (Tilted Optimized Non-saturating Excitation - variable excitation flip angel to compensate inflow saturation effects in 3D MRA - selectable on desired flow direction and speed - Gradient Motion rephasing permitting effective reduction of flow artifacts Standard Motion Correction - *syngo* Blade - improves image quality by minimizing and correcting for the effects of motion during an MR sequence acquisition. e.g. head, spine, orthopedic imaging and the abdomen - 1D PACE (Prospective Acquisiton CorrEction) allows examination of patients with free breathing - 2D PACE (Precise Motion Correction) detects and corrects respiratory motion eg of the heart or liver MAGNETOM Aera runs *syngo* MR software. *syngo*® is the unique software platform for medical applications. Parallel working and one-click exams are efficiently supported and increase productivity. Parallel scanning and reconstruction are standard. The unique Phoenix technique is the easiest way to exchange protocol data. It supports intelligent extraction of sequence parameters from images acquired on a MAGNETOM Aera system. Inline technologies, scan@center or AutoVoiceCommands speed up the workflow further. The context-sensitive "Online Help" function and *syngo* Scan Assistant offer support and propose solutions to MR-specific questions and parameter conflicts. Studies can be easily networked and managed using the standard DICOM 3.0 protocol for efficient support of workflow. The following standard functions are supported: Send/Receive, Query/Retrieve, and Basic Print for DICOM-compatible laser cameras (camera is not included in the basic unit), DICOM Worklist, DICOM Storage Commitment (SC) DICOM Modality Perform Procedure Step (MPPS), DICOM Structured Report (SR), DICOM Study Split. **Patient Communication** - The intercom system includes an ergonomically designed patient communication unit for desktop positioning on the *syngo* Acquisition Workplace and pneumatic headphones for the patient. - Active Noise Cancellation allows for increased user comfort in the control room combined with comprehensive patient supervision. - It controls emergency table stop, volume control of speaker and headphones in the examination room, volume control of speaker in the control room, response to the patient's activation of the assistance-call button and provides a connection to an external audio system (external audio system is not included in the basic unit) for music playback. **Computer system** The high performance host computer and the new high performance measurement and reconstruction system are ideally suited for even the most demanding applications. The PC-based computer system uses the intuitive *syngo* MR user interface. The computer system includes the following components: High-performance measurement and reconstruction system

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14416900
MAGNETOM Aera - System
	- Two Intel Quadcore Processor ≥E 5540
	- clock rate of ≥2 × 2.53 GHz
	- Main memory (RAM) of 48 GB,
	- Hard disk for raw data ≥300 GB
	- Hard disk for system software ≥100 GB
	- Parallel Scanning and Reconstruction of up to 8 data sets
	- Reconstruction speed
	  - 12.195 recons per second (256 x 256 FFT, full FoV)
	  - 37.914 recons per second (256 x 256 FFT, 25 % recFoV)
	
	High-performance host computer
	- Intel Xeon processor ≥W3520 QuadCore
	- clock rate ≥2.66 GHz
	- Main Memory (RAM) ≥4 GB
	- three hard disks
	  - system SW ≥146 GB SAS
	  - data base ≥146 GB SAS
	  - images ≥146 GB SAS
	- DVD-R writer for CD-R (approx. 4000 images 256^2 DICOM Standard, ISO 9660) and DVD-R (approx. 25 000 images 256^2 DICOM Standard, ISO 9660) storage of DICOM data or other data like AVI files
	  - DVD-ROM drive
	  - Electronic mouse.
	
	- The combination of host computer and the measurement and reconstruction system offers a truly powerful imaging system designed for large image matrix sizes of up to 1024 x 1024. The unrestricted multitasking capability allows time-saving parallel scanning and reconstruction.
	- High-resolution 19" color LCD flat screen monitor with 1280 x 1024 pixel display, integrated gamma correction for optimum display of radiographic grayscale images and automatic backlight control for long term brightness stability.
	
	Installation:
	- The relatively lightweight design of the MAGNETOM Aera in most cases eliminates the need for structural building reinforcements and thus facilitates installation in upper floors.
	- The compact integrated design allows for short installation times and reduces the required space to less than 30 sqm (323 sq. ft.) for the entire installation. The minimum room height clearance is only 2.40 m (7' 10").
	- MAGNETOM Aera allows siting of the system without a dedicated computer room - no additional cooling or floor requirements.
	- MAGNETOM Aera combines state-of-the-art performance with peace of mind. High system availability is ensured by the expert, highly trained Siemens MR service engineers;
	- Your Siemens service contract (not included in the basic unit) offers a comprehensive range of benefits such as Uptime Remote Diagnostics for improved productivity and maximum uptime.

14416901 **Tim [204x48] XJ Gradients #Ae**	**Tim [204x48] performance level** Tim 4G offers DirectRF - a completely redesigned RF architecture. This new all digital-in/ digital-out design integrates all RF transmit and receive components at the magnet, eliminating analog cables for true signal purity. This compact and efficient design enables an dynamic feedback control for temporal stability and power linearity. The all-new innovative coil architecture packs more coil elements in a smaller space and allows for simultaneous connection of up to 204 coil elements. Combined with the 48 independent RF channels advanced iPAT capabilities and SNR are enabled. An additional benefit of multiple coil elements and receiver channels is improved performance in multi-directional, i.e. three dimensional, high-speed, high-resolution iPAT in the head-feet, anterior-posterior or left-right directions. **XJ gradients** Siemens XJ gradients provide actively shielded, water cooled world-class gradients. All axes are force-compensated.

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Part No. / Product	Description
(Continued) **14416901** **Tim [204x48] XJ Gradients #Ae**	The XJ gradients have: - Maximum gradient amplitude of 33 mT/m, per axis, i.e. 57 mT/m vector summation gradient performance, - Maximum slew rate 125 T/m/s per axis, i.e. 216 T/m/s vector summation, - Minimal rise time 264 µs, from 0 to 33 mT/m amplitude - Maximum output voltage for each of the gradient axes 2000 V - Maximum output current for each of the gradient axes 625 A - Separate cooling channels that simultaneously cool primary and secondary coils allow the application of extremely gradient intensive techniques in a new class of performance. - 100% duty cycle for fast and demanding techniques such as ultra-short TE MRA in continuous operation, thin slice single breath-hold liver studies and EPI imaging techniques (all optional in appropriate clinical packages). - Variable Field-of-View selection from 0.5 cm to 50 cm (up to 45 cm in z direction) for optimal coverage and highest spatial resolution in diagnostic. The minimum slice thickness in 2D and 3D is 0.1 mm and 0.05 mm, respectively. - Acquisition of sagittal, transverse, coronal, single oblique and double oblique slices with highest resolution. - The extremely compact water-cooled gradient amplifier features a modular expandable design with excellent linearity and pulse reproducibility. It is digitally controlled and has very low switching losses due to ultrafast solid state technology.
08464872 **PC Keyboard US english #Tim**	The keys of the numerical key panel are assigned to syngo-specific functions and labeled with the corresponding syngo icons. The keyboard supports the country specific special characters.
14416914 **Pure White Design #T+D**	The unique color and material selection enhances the visual appeal of the new system design, thereby creating an enticing, patient-friendly impression. The Dot Control Centers and the unique Dot Display are neatly integrated into this main face plate. The aesthetically pleasing and ergonimcally designed control elements of the Dot Control Centers are well illuminated for easy visual recognition. In particular, the table cover and the asymmetric left deco area cover have also been designed to promote a modern visual appearance. This combination of ingenuity and practical design as presented with "Pure White" design with its brilliant white and the silver trim simply makes the MAGNETOM an overall visually appealing system and creates a patient-friendly environment.
14416905 **Tim Table #Ae**	The new MAGNETOM Aera table with its light appealing design allows for a fast patient preparation and maximized patient comfort. It provides unobstructed foot space for attending staff and direct access to the patient. The patient table can be lowered to a minimum height of 52 cm from the floor, for easier patient positioning and better accessibility for geriatric, pediatric or immobile patients. The Tim Table can be moved with two clicks into the isocenter - one click to the upmost position and one click into the isocenter. The tabletop travels beyond the rear end of the system, enabling additional patient access. An infusion stand is integrated to allow for fast patient set up of critical patients. Multiple Tim4G coils can be connected at once for efficient and patient friendly examinations. The seamless integration of multiple Tim4G coils is possible via 4 SlideConnect and 4 DirectConnect connector slots, which are embedded in the table. This allows for comprehensive examinations without the need of repositioning.
14402592 **Inline Composing syngo #Tim**	The Inline Composing option includes the following functions: - Inline calculation of full-format images of the spine, the central nervous system or the vessel tree, for example, combined from multiple overlapping steps. - Dedicated composing algorithms, optimized for the generation of anatomical or angiographic full-format images. - Data sets with different FoV, resolution, matrix and slice thickness can be combined. - Generation of full-format images from inline-computed MIPs. - Different inline functions can be combined; e.g. in case of multiple-step angios, Inline subtraction, Inline MIP and Inline Composing can be performed fully automatically. - Full-format acquisitions from Inline Composing are ideal for further measurement planning on large FoV, e.g. with the Tim Planning Suite (optional, urgently recommended). *Prerequisite: Software syngo MR B13.*

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Part No. / Product	Description
14405224 **Composing syngo #Tim**	The option features: - Display and storage of full-format images, e.g. of the spine, the central nervous system or the vessel tree (starting from *syngo* MR B13), combined from multiple overlapping stages. - Dedicated composing algorithms, optimized for the generation of anatomical or angiographic (starting from *syngo* MR B13) full-format images. - Data sets with different FoV, resolutuion, matrix and slice thickness can be combined (starting from *syngo* MR B13). - Generation of full-format images from inline MIPs (starting from *syngo* MR B13). - Original, detail and reconstructed images can be displayed in different layouts. - Comparison of two reconstructed images for evaluation and diagnosis is thus made possible. - Filming in different layouts is supported. - Measurements of basic functions via reconstructed images is then possible. - Measurements of extended orthopedic functions: scoliotic angle, kyphotic angle, vertical distance measurement and differences in width of the intervertebral spaces. *Prerequisite: SW syngo MR B13.*

14416923
Abdomen Dot Engine #T+D
	Abdomen Dot Engine
	Guidance view
	- Step-by-step user guidance is seamlessly integrated.
	- Example images and guidance text displayed for each step of scanning workflow.
	- Both images and text are easily configurable by the user
	
	Patient View
	- Easily tailored to the individual patient.
	- Several pre-defined, integrated Dot Exam Strategies are included
	- Single click update of queue and the complete scan set-up.
	- Integrated contrast media protocols (Vibe Dynamic)
	
	Parameter View
	- A new view that displays the essential parameters
	- Can be opened at any time during an examination
	
	Automatic sequence scaling
	- Auto FoV: optimal FoV is proposed, based on the localizer images.
	- AutoNavigator: based on automatic breathing pattern detection and scaling of triggered scans.
	- Breath-hold adaptations
	
	Dot Exam Strategies
	Personalize to the individual patient condition and clinical need.
	- Predefined strategies:
	  - Standard with breath-hold
	  - Standard with PACE triggering
	  - Limited patient capabilities using *syngo* BLADE and PACE triggering.
	
	Dot Decisions
	Seamlessly integrated into scanning workflow:
	- Select the queue and the appropriate protocol or set of protocols are automatically added.
	- Abdomen Dot Engine integrates MRCP and Diffusion decision points.
	
	Timeline setup and monitoring
	Convenient visual overview of multi-phase breath-hold examinations and CM enhancement curve visualization.
	
	Auto Voice Commands
	- Played automatically
	- Facilitate timing of scanning, breathing and contrast media.

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Part No. / Product	Description
(Continued) **14416923** **Abdomen Dot Engine #T+D**	- The user controls breath-hold or pauses are actually played - Ability to add pauses between automatic breath-holds. ***Auto Bolus Detection*** - Automatically initiates the dynamic upper abdomen examination based on bolus detection. - The user can override this function. ***Inline radial range calculation for MRCP*** - MRCP is measured - Inline Radial Ranges are automatically generated. ***Inline Subtraction*** Automatically subtracts the native (non-contrast) measurement from the arterial, portal-venous and late phase. ***Inline Registration*** The system automatically performs a registration / alignment of the anatomy for the different dynamic phases, of interest when examining nodular enhancing pathologies. ***Customization*** Existing Dot Engines can be modified by the user to their individual standard of care. - Add / remove protocol steps - Change guidance content (images and text) - Change or add Dot Exam Strategies and Decision Points - Modify the Parameter View
07820082 **Inline Perfusion #Tim**	**Inline Technology – Processing Instead of Post-processing.** Inline Technology helps to streamline the clinical workflow by automating post-processing steps before image viewing. This facilitates getting clinical results immediately. This package integrates Inline technology with perfusion imaging. Automatic real-time calculation of Global Bolus Plot (GBP), Percentage of Baseline at map (PBP) and Time-to-Peak map (TTP) with Inline technology is possible. An optimized EPI sequence for perfusion-diagnostics is included in the standard Tim Application Suite. With this package real-time calculations are done of anatomical images and, in addition, of a global bolus plot and a Time-to-Peak map for visualizing the time dependence of tissue perfusion.
14418563 **Neuro Perfusion Evaluation,USA #T+D**	**Post-processing features:** - Flexible selection of the Arterial Input Function (AIF) by the user. - Pixelwise calculation of the hemodynamic parameters relative Mean Transit Time (relMTT), relative Cerebral Blood Volume (relCBV), relative Cerebral Blood Flow (relCBF), corrected relative Cerebral and Blood Flow (relCBF) for compensation of blood brain barrier leakage. - Pixelwise calculation of maximum signal loss due to contrast agent enhancement (Percentage of Baseline at Peak, PBP) and of the time to the maximum signal loss (Time-To-Peak, TTP). - Display of the global signal time course (averaged over all slices) to assess the quality of the exam. - Predefined post-processing protocols available, user definable post-processing protocol are possible. **Visualization features:** - Colored display of relMTT-, relCBV-, relCBF-, relCBFcor, PBP- and TTP-maps. - Zoom, pan, annotate. - Colored images can be saved as DICOM images.
14402527 **SWI #Tim**	Despite a strong sensitivity for local magnetic field inhomogeneities Susceptibility Weighted Imaging (SWI) as a 3D technology keeps up the signal near large susceptibility leaps due to very thin slices and high resolution in the slice (high image quality e.g. in the area of the forebrain near the frontal sinus). Moreover, the phase information of the MR signal is integrated in the image display. In order to further increase sensitivity for localized microscopic magnetic field inhomogeneities, large-area magnetic field inhomogeneities (e.g. caused by susceptibility leaps near the sinus) are specifically suppressed in the phase images.

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Part No. / Product	Description

(Continued)
14402527
SWI #Tim
	This allows even small amounts of deoxygenated hemoglobin (e.g. in cerebral veins) or from products of hemoglobin decomposition (e.g. from hemorrhages) to be displayed.
	Interesting measuring times for the ultra-high-resolution 3D protocols are achieved through parallel imaging with iPAT (GRAPPA).
	
	The Susceptibility Weighted Imaging package includes:
	– SWI measuring sequence, iPAT compatible
	– optimized measuring protocols for the head
	- inline-postprocessing for automatic calculation of relevant images within the scope of image reconstruction:
	  - calculation of susceptibility-weighted images
	  - venous angiography: MIP of a thin slice block
	SWI has been optimized for clinical use to support diagnostics with cerebrovascular diseases (e.g. cerebral insult), venous malformation, brain trauma and tumors.
	
	Prerequisite: Software syngo MR B13

14416908 **Tim Whole Body Suite #T+D**	Tim and the Tim Whole Body Suite enable for true whole body MR scanning for head-to-toe imaging. Whole body imaging with highest image quality without patient repositioning and without the need to change a single coil, not even once, this means whole body imaging without compromise. The Tim Whole Body Suite features: - The all-new Tim Table or Tim Dockable Table enable a full Field-of-View with coverage up to 205 cm (6' 9"). The table top has the same length as the standard system without whole body capabilities. Additional free space is required at the rear part of the magnet to ensure, that the table movement is not limited by the rear wall. - Table movement to its full extent can be remotely controlled from the operator console either by the operator or by sequence protocols. - Protocols and programs for whole body MR angiography and morphology e.g. for metastasis visualization and preventive care examinations. - Whole body MR Angiography is possible with high speed, high resolution and high image contrast on the entire volume combining high speed gradients and iPAT. - The large FoV of 205 cm supports the assessment of metastases distribution in the body with sequences such as TIRM (Turbo Inversion Recovery).
14405328 **TWIST syngo #Tim**	*syngo* TWIST provides: - Visualization of contrast agent dynamics in the vessel system of interest with maximum flexibility. - Needs only a low amount of contrast agent. - Imaging in all body regions, e.g. carotids, pulmonary and peripheral vessels with brilliant spatial and temporal resolution. - Clear separation of the arterial and venous phase. - High speed acquisition by intelligent k-space strategies and use of iPAT, powered by Tim. - *syngo* TWIST provides fat suppression using water selective excitation. - Inline technologies, such as subtraction and MIP are provided for optimal workflow. - In case of very high spatial resolution *syngo* TWIST may even replace conventional static MR angio. Moreover, *syngo* TWIST does not require any bolus timing - just inject and go.
14418521 **syngo Expert-i #T+D**	The option is integrated in the *syngo* user interface thus enables easy access to the user interface of the *syngo* Acquisition Workplace for planning and processing support purposes. The access is protected by appropriate security mechanisms (active enabling prior to every connection through the user present on site, password protection), in order to prevent unwanted connections. The client software can be operated on any commercial PC with the following specification: - Operating system: Windows NT or XP - 32 bit graphics board - 850 MHz CPU

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Part No. / Product	Description
14416958 Peripheral Angio 36 #Ae	The Peripheral Angio 36 has a 36-element design with 36 integrated preamplifiers distributed over 6 planes with 6 elements each. A uniquely designed non-ferromagnetic coil cart for safe coil storage is included. The PA Matrix Coil is also shipped with a set of positioning cushions for proper handling. No tuning of the fully iPAT-compatible Peripheral Angio 36 is required. With a length of about 1m both legs are covered from the iliac artery level down to the foot arch vessels using multiple, flexible wings. For the visualization of the abdominal aorta and the iliac bifurcation it can be combined with the Body 18 and Spine 32. For larger body coverage eg whole body with up to 205 cm possible coverage, it can be combined with Head/Neck20 or a further Body18 to allow for large Field of View examinations with high patient comfort. Patient set up is done once and no repositioning is necessary For peripheral Angiography the PA Matrix coil will be typically used in feet-first position, but also head-first positioning for whole-body examinations is possible (optional Tim Whole Body Suite required). The dimensions of the Peripheral Angio 36 are: 860 mm × 300 - 640 mm × 280 mm
14416960 Shoulder 16 Coil Kit #Ae	The iPAT compatible Shoulder 16 Large and Shoulder 16 Small are ergonimically designed and adapted to the shape of the shoulder. The different sizes obtain maximum image quality for different body sizes: - 165 mm (6.5 in) diameter for small and medium sized shoulders - 200 mm (7.9 in) diameter for large shoulders The coils can be used either for left or right shoulders. It features sliding attachments to the base plate and can easily be adjusted for comfortable positioning. The coils excels in highest resolution imaging with exceptional signal/noise ratio.
14416961 Hand/Wrist 16 #Ae	The 16-element coil with 16 integrated pre-amplifiers excels in highest resolution imaging with exceptional signal/noise ratio, while taking full advantage of iPAT in all directions. Hand/Wrist 16 is ergonomically designed and adapted to the shape of the hand/wrist region. The coil features a hinged design of the upper part and slidable attachment to the base plate. Together with the included stabilization pads the coil allows easy, fast and comfortable patient positioning.
14416962 Foot/Ankle 16 #Ae	The 16-element coil with 16 integrated pre-amplifiers excels in highest resolution imaging with exceptional signal/noise ratio, while taking full advantage of iPAT in all directions. Foot/Ankle 16 is ergonomically designed and features a boot-like coil design. Together with the included stabilization pads the coil allows easy, fast and comfortable patient positioning.
14430403 Tx/Rx 15-channel Knee Coil DDST #Ae	Thanks to its 15-channel design this coil is perfectly suited for high-resolution images with excellent SNR. With the arrangement of the antennas in three rings of 5 elements each, the coil is specially designed for parallel imaging with high acceleration factors. The coil is positioned on a laterally movable support and therefore allows for comfortable patient positioning of both legs for off-center examinations. SlideConnect Technology allows for fast and easy patient preparation, resulting in less table time. Furthermore, the upper part can be removed for easier patient positioning. Additional cushions allow for optimum patient immobilization. The integrated transmission function makes volume-sensitive excitation with greatly reduced RF power possible on the one hand and, on the other, prevents aliasing artifacts (e.g. due to the other knee).
14407258 MR Workplace Table 1.2m	The table design matches the MED-wide uniform design with silver-finished rim, use of friendly colors matching the Siemens color pattern for MAGNETOM and SOMATOM. - Width 120 cm - Depth 80 cm - Height 72 cm

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Part No. / Product	Description
14407261 **MR Workplace Container, 50cm**	The table design matches the MED-wide uniform design with silver-finished rim, use of friendly colors matching the Siemens color pattern for MAGNETOM and SOMATOM. Table height 72 cm, matching the *syngo* Acquisition Workplace and *syngo* MR Workplace console table, for installation in the operator room either directly to the left or right of the *syngo* Acquisition Workplace or *syngo* MR Workplace console table or separately. - Width 50 cm - Depth 80 cm - Height 72 cm Alternatively this casing is also suited for the Recon image processor (except for the MR systems with the Tim generation: there the Recon image processor is always placed inside the electronics cabinet).
08857828 **UPS Cable #Tim**	Power cable to connect the 3 KVA Powerware 9125 small UPS system (pn PWR9125H3000) to the ACC cabinet of the MAGNETOM Avanto/ Espree/ Tim Trio for backing up the host computer and imager. Configuration includes connection box. The standard cable length is 9 m.
14413662 **UPS Powerware PW9130G-3000T-XLEU**	Voltage range: 180 - 276 V Input frequency: 50 / 60 Hz Output voltage: 230 VAC Dimensions (H x W x D): UPS 346 x 214 x 412 mm incl. UPS bracket set Weight: approx. 36 kg
MR_ECLS4GDOT **E.class for MAGNETOM Tim 4G & Dot Users**	E.class for MAGNETOM Tim 4G and Dot software users. This e.class introduces current Siemens MAGNETOM users to Tim 4G and Dot software on the MAGNETOM Skyra and Aera. System configuration, hardware and software differences will be reviewed. Dot Engines, Dot Guidance, including new features and pulse sequences will be presented and discussed. This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.
MR_ECLS4GDOT **E.class for MAGNETOM Tim 4G & Dot Users**	E.class for MAGNETOM Tim 4G and Dot software users. This e.class introduces current Siemens MAGNETOM users to Tim 4G and Dot software on the MAGNETOM Skyra and Aera. System configuration, hardware and software differences will be reviewed. Dot Engines, Dot Guidance, including new features and pulse sequences will be presented and discussed. This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.
4MR5142869 **Armrest #MR**	An MR-compatible arm rest that supports the patient's arm on the magnet patient table when starting intravenous lines. The board is removed after the IV is inserted. This product has been tested and verified for compatibility with the following Siemens' products: MAGNETOM Trio, Verio, Espree, Essenza, Avanto, Symphony, Area Skyra and Biograph mMR. Compatibility with other products cannot be assured and may void service contracts and/or system warranties.
KKTECOMR_45 **KKT ECOCHILLER 122L**	**Chiller KKT ECO 122 - L** Function: Supplies dedicated primary chilled water in cases where no chilled water supply is available on site. Air-cooled version, for outdoor installation up to a maximum distance of 25 m for connection to the IFP, incl. 50 m FOC for control. The cooling capacity of the chiller is 45 kW, the chilled water temperature is 20°C, the water flow is 130 l/min. Ambient temperature: -20 to +48°C Connection rating: 21 kW Voltage: 3/PE 400 V to 480 V / 50/60 Hz Fuse rate: 63 A Power consumption: 47 A

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Part No. / Product	Description
(Continued) KKTECOMR_45 KKT ECOCHILLER 122L	Dimensions: 2000 mm x 1100 mm x 2100 mm (height x width x depth). Weight: 710 kg Noise level at a distance of 10 m at outside temperatures of: 21°C 46 dB(A) 32°C 51 dB(A) 48°C 57 dB(A) **IFP (Interface Panel)** Main functions of the IFP: - Interface function between the KKT chiller and the MR cabinet. - Water supply for MREF, MBB, CBB and TX box. Additional devices such as integrated differential pressure control, a pressure gage, and a filter are used in order to guarantee the precise functioning of the cooling circuit, especially for the cold head compressor (MREF). The connection must be made locally with 2" lines up to a maximum distance of 25 m. Dimensions: 800 mm x 1150 mm x 210 mm (height x width x depth). Weight: 67 kg
CHILINST_AVT Chiller Start-up and Warranty for TIM	Start up and initial set up service performed by the chiller manufacturer or designated service representative. This service does not include the piping and other prerequisite siting, of the waterchiller, which are the responsibility of the customer. 12 months warranty and performed by the chiller manufactuer.
MRWSE MR Wall sign - English	Highly durable 1mm PVC wall signs with high-tack, double-back tape. Sticks to most any surface. English. 12" x 18".
14409198 Native syngo #Tim (Optional)	*syngo* NATIVE offers: - Non-contrast enhanced MRA - Separate imaging of arteries and veins - Visualization of - e.g. - renal arteries or peripheral vessels The *syngo* NATIVE package comprises: - *syngo* NATIVE TrueFISP - *syngo* NATIVE SPACE
14418746 Cardiac Dot Engine, USA #T+D (Optional)	**Cardiac Dot Engine** ***Guidance View*** - Step-by-step user guidance is seamlessly integrated. - Example images and guidance text are displayed for the individual steps of the scanning workflow. - Both images and text are easily configurable by the user ***Patient View*** - Within the Patient View the user can easily tailor the exam to each individual patient (e.g. patient with arrhythmia, breath hold capability). - Pre-defined Dot Exam Strategies are integrated. The user just selects the appropriate strategy with one click and the queue and the complete scan set-up are automatically updated ***AutoFoV (automatic Field of View calculation)*** - Based on the localizer images the optimal FoV is automatically estimated. - If the patient moves during the examination, this step can be repeated at any time ***Automated parameter adaptation*** - Scan parameters are automatically adapted to the patient's condition (e.g. heart rate) ***Novel heart localization method*** - On-board guidance visually facilitates anatomic landmark settings which are used for calculation

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Part No. / Product	Description
(Continued) **14418746** **Cardiac Dot Engine, USA #T+D (Optional)**	- Automated localization - Automated localization of short-axis views ***Cardiac Views*** - Easy selection of cardiac views (e.g. 3 chamber view) during scan planning ***Inline Ventricular Function Evaluation*** - *syngo* Inline VF performs volumetric evaluation of cardiac cine data fully automatically right after image reconstruction. - If desired, inline calculated segmentation results can be loaded to 4D Ventricular Function Analysis for further review or processing ***Cardiac specific layout for the Exam task*** - layouts show the new physio display and are configured for every step of the exam ***Automated Naming*** - Automated naming of series depending on cardiac views and sequence type ***Auto Voice Commands*** - Seamlessly integrated into scanning workflow. - Played automatically - The user controls breath-hold or pauses are actually played - Ability to add pauses between automatic breath-holds ***Dot Exam Strategies*** The workflow can be personalized to the individual patient condition and clinical need. The following predefined strategies are included. They can be changed at any time during the workflow: - **Standard:** Segmented acquisition techniques - **Limited patient capabilities**: switch to real-time and single shot imaging if breath-hold is not possible or arrhythmias occur ***Customization*** Existing Dot Engines can be modified by the user to their individual standard of care. - Add/remove protocol steps - Change guidance content (images and text) - Change or add Dot Exam Strategies and Decision Points - Modify the Parameter View
14430391 **RESOLVE #T+D (Optional)**	RESOLVE is a diffusion-weighted, readout-segmented EPI sequence optimized towards high resolution imaging with reduced distortions. The sequence uses a very short echo-spacing compared to singleshot EPI, substantially reducing susceptibility effects. A 2Dnavigator correction is applied to avoid artefacts artifacts due to motioninduced phase errors. This combination allows diffusion weighted imaging of the breast, prostate, brain and spinewhole body with a high level of detail and spatial precision. Additionally, an automatic reacquisition of data with large phase errors can be used to ensure that diffusion-weighted images of the brain are not affected by CSF pulsation. *S-Text o For neuro applications where high-resolution diffusion is required. Is the basis of distortion insensitive high-resolution DTI, e.g. in spine.Especially beneficial for 3T systems.*
14416965 **Arterial Spin Labeling 3D #T+D (Optional)**	*syngo* ASL 3D provides the physician a tool for fast qualitative perfusion assessment throughout the whole brain without the use of a contrast agent. High spatial resolution 3D volumes are acquired with echo planar imaging and multiple refocusing pulses (GRASE). This 3D technique provides rel CBF, perfusion weighted scans and segmented acquisition.

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Part No. / Product	Description
14426332 **Tx/Rx CP Head Coil #Ae** **(Optional)**	This enables studies with very high spatial resolution and very short scan time. The upper part of the coil is detachable and can be fitted with a mirror allowing the patient a rear view out of the magnet. Displaceable cushions are provided with the coil for positioning. The coil is suited for head proton imaging and brain spectroscopy.
14416952 **Coil Storage Cart #T+D** **(Optional)**	The cart may be rolled to convenient locations in the examination room and can be opened up to work like a shelf. The coil storage cart has multiple drawers and trays as well as many other storage spaces for coils, cushions and miscellaneous items. Its dimensions are: Width 140 cm (4' 7") when closed and 280 cm (9' 12") when opened, depth 54 cm (1'9") and height 121 cm (3'12").
14416906 **Tim Dockable Table #Ae** **(Optional)**	The new MAGNETOM Aera table with its light appealing design allows for a fast patient preparation and maximized patient comfort. It provides unobstructed foot space for attending staff and direct access to the patient. The patient table can be lowered to a minimum height of 56 cm (18.5") from the floor, for easier moving of immobile patients and better access for geriatric, pediatric patients or immobile patients. The Tim Table can be moved with two clicks into the isocenter - one click to the upmost position and one click into the isocenter. The tabletop travels beyond the rear end of the system, enabling additional patient access. Multiple Tim4G coils can be connected at once for efficient patient set up and patient friendly examinations. The seamless integration of multiple Tim4G coils is possible via 4 SlideConnect and 4 DirectConnect connector slots, which are embedded in the table. This allows for comprehensive examinations without the need of repositioning. The Tim Dockable Table is easily adjustable for height even in the undocked state. A minimum height of 61 cm allows for easy wheelchair access or easy patient movement to the hospital bed. The integrated infusion stand and arm rests allow for fast patient set up anywhere and also for critical patients
08464757 **Interactive RealTime #Tim** **(Optional)**	- Interactive realtime scanning for e.g. cardiac exams - Uses ultra-fast Gradient Echo sequences for high image contrast - Realtime interactive slice positioning and slice angulation - Realtime reconstruction of the acquired data - The user can navigate in all planes on-the-fly during data acquisition
14402593 **Tim Planning Suite** **(Optional)**	- Easy planning on a FoV of any desired size (up to 205 cm). - Planning of multiple steps simultaneously, e.g. on a whole-body image, with only one Set-n-Go protocol - which includes several steps. - Tim Planning Suite UI: Dedicated user interface and exclusive tools for effective and smooth working on a large FoV. - Multiple slice groups with their overlap are displayed together and can be easily arranged. - All steps can have independent sets of parameters. - All steps are displayed together with a single mouse click. - Easy positioning of all steps, for example, through Align FoV. - Full support of . - Full support of Phoenix, thus maximum reproducibility, for example, for follow-up studies, multi-centric studies or exchange of experiences across different institutions. - Dedicated protocols are provided for the Tim Planning Suite, for example, for orthopedic, oncological or angiograhic indications. - Inline Composing for optimized workflow for the generation of full-format images of anatomic or angiographic data sets is a prerequisite. Efficient measurement planning on these full-format images with Tim Planning Suite. - It is highly recommendable to order application training! *Prerequisite: Software syngo MR B13* -
08464740 **Flow Quantification #Tim** **(Optional)**	Flow Quantification enables the acquisition of flow encoded images and the evaluation of blood as well as of cerebro-spinal fluid (CSF). Sequences include: - ECG triggered 2D phase contrast with iPAT support

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Part No. / Product	Description
(Continued) 08464740 Flow Quantification #Tim (Optional)	- Retrospective reconstruction algorithms for full R-R interval coverage - Maxwell Term Compensation -
07365419 Argus Flow (Optional)	The combination of automated contouring and easy-to-use editing tools, provides users with a rapid way to quantify flow parameters. Argus Flow includes: - Calculation of flow and velocity parameters(e.g. mean and max velocity, mean, cumulative, prograde, retrograde flow) for large and small vessels. - Semi-automatic detection of regions of interest over time - Color-coded display of velocity values - Calculation of flow and velocity parameters (e.g. peak velocity, average velocity, flow, integral flow) - Graphical and tabular display of the results (e.g. flow-time curves) - Integration of the results in Argus structured report and storage in DICOM format for documentation.
14416929 Advanced Cardiac Package #T+D (Optional)	Combining the unique advantages of Tim and *syngo* BEAT with iPAT and powerful gradients, it allows performing cardiac MR examinations without compromise in image resolution or acquisition speed. *syngo* BEAT is a unique tool for fast and easy cardiovascular MR imaging. It provides 1-click switch from cine imaging to tagging for wall motion evaluation and 1-click switch from 2D to 3D imaging. *syngo* BEAT automatically adjusts all parameters associated with the changes. **Cardiac and Vessel Morphology** - Multi echo technique for e.g. thalassemia assessment - 3D aortopathy imaging with free breathing (SPACE) **Global or Regional Wall Motion Analysis with *syngo* BEAT** - 3D cine acquisition for full CT-like heart coverage - 2D segmented FLASH for visualization of the regional wall motion using various tagging techniques (grid or stripes) **Dynamic myocardial imaging with *syngo* BEAT** - Ultra-fast, high-SNR sequence for dynamic imaging with GRE EPI contrast for stress and rest exams **Tissue characterization with *syngo* BEAT** - Robust myocardial tissue characterization with 3D PSIR (phase-sensitive inversion recovery), e.g. after myocardial infarction or for differentiation of cardiomyopathies - Fast and complete coverage of the myocardium with IR 3D FLASH and TrueFISP **Coronary imaging with *syngo* BEAT** - 3D Whole-Heart non-contrast Coronary MRA - 3D Whole-Heart MRA with advanced free-breathing navigator compensating diaphragm shifts during the acquisition (motion-adaptive respiratory gating)
14407334 Argus 4D Ventr.Function syngo #Tim (Optional)	This package includes Argus Function as well as Argus 4D Ventricular Function. Argus Function: - Automatic, semi-automatic, or manual segmentation of the left and semi-automatic or manual segmentation of the right ventricle. - Volumetric analysis and wall thickness analysis. - Output of parametric results, volume-time curves and bull's-eye plots. - DICOM Structured Reporting. Argus 4D Ventricular Function:

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Part No. / Product	Description
(Continued) 14407334 Argus 4D Ventr.Function syngo #Tim (Optional)	- Calculation of volumetric cardiac data of a given patient very quickly and easily. - Parametric results and volume-time curves are calculated opon automatic creation and adaptation of a 4D model of the left ventricle. - The resulting 4D model of the patient's heart can be visualized superimposed to anatomical images as a reference.
14416944 DTI Package #T+D (Optional)	**Diffusion Tensor Imaging** Diffusion Tensor Imaging allows for a complete description of the diffusion properties of the brain within the scope of the tensor diffusion model, both for anisotropic and isotropic diffusion. Efficient diffusion direction schemes are pre-defined to allow for optimal diffusion directional resolution. Schemes with up to 256 directions can be selected. Inline technology enables automatic and immediate calculation of the diffusion tensor, including grey-scale and colored "fractional anisotropy" (FA) map derived from it. Details: - Measurements with up to 256 different directions and with up to 16 different b-values - Inline calculation of tensor, grey-scale and colored FA map, ADC map and trace-weighted image - Support of parallel imaging (iPAT) - Clinical protocols with full head coverage, incl. inline calculation of tensor, FA, ADC and trace-weighted images in 4 minutes. **DTI Tractography *syngo*** *syngo* DTI Tractography is optimized for the clinical use by providing advanced 3D visualization of white matter tracts in the context of 2D or 3D anatomical datasets and DTI datasets. DTI data sets can be explored fast and intuitively using the interactive QuickTracking. QuickTracking instantaneously displays the tract originating from the mouse pointer position while moving over the DTI data set. This also allows identifying qualified regions to place seeding ROIs. Seed points can be set to assess connectivity by tracking with single ROI and with multiple ROIs.Furthermore they can be placed in fused views displaying the anatomical reference and e.g. the colored FA map simultaneously. Texture Diffusion, a highly versatile in-plane visualization of white matter tracts, allows to display and read DTI Tractography results on PACS reading stations and in the OR. At the same time the package provides the scientific user with the flexibility to configure the tracking algorithm and to change display settings for the tracts. Tract and seeding ROI statistics are included to support publications (e.g. mean/max FA value, min/mean/max ADC value). All views can be exported as DICOM images or bitmaps. Tract and seeding ROI statistics can be exported as html files. **DTI Evaluation** Clinical applications are supported by a dedicated DTI evaluation mode to support diagnostics of white matter diseases (e.g. multiple sclerosis and brain maturation disorders). Based on the tensor, in addition to the already inline-calculated parameter maps, further maps characterizing the anisotropy of diffusion properties can be calculated and stored. Multiple diffusion parameter maps (e.g. Fractional Anisotropy, ADC, b=0) and an anatomical image are displayed next to each other in the same slice position for comparison. The images can be evaluated together based on ROIs and the results can be documented in a table. The display options include 2D and 3D tensor graphics, colour-coded images and overlay images on the anatomical images. In addition, the package offers the scientific user full flexibility of 2- and 3-dimensional visualization of the diffusion tensor with measures of isotropic and anisotropic (fractional and relative) diffusion, Eigen vectors (E1, E2, E3) of the diffusion tensor and shape-descriptive measures of the diffusion tensor (linear, planar, spherical).
14416943 Neuro fMRI Package #T+D (Optional)	**Inline BOLD Imaging** The BOLD imaging package allows the user to define protocols which, apart from the measurement, configure automatic evaluation of the measured data during the scan. With Inline Technology it is thus possible to generate statistical images (t-value) based on 3D motion corrected and spatially filtered data automatically in real time without any further user interaction. The Inline display of activation cards allows the user to decide during the scan whether enough statistical power has built up for his brain mapping task or if the examination is corrupted by motion. As a result examinations will be shorter with a higher success rate. Functional brain mapping can be easily integrated into the clinical routine e.g. prior to neurosurgical interventions. Additional Features: - Inline retrospective 3D motion detection and correction in 3 rotational and 3 translational directions

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Part No. / Product	Description
(Continued) **14416943** **Neuro fMRI Package #T+D (Optional)**	- Inline t-statistics calculation for variable paradigms and display of t-value images - Statistical evaluation by means of "General Linear Model (GLM)": - Paradigms can be configured - Transitions between passive and active states can be modelled by the hemodynamic response function - Correction of low-frequency trends - Allows for time delays due to the BOLD-EPI slice order during a measurement - Display of GLM design matrix - Display of a continuously updated t-value card during measurement - Display of colored activation cards continuously updated during measurement, overlaid over the respective BOLD images using Inline technology - MOSAIC image mode for accelerating display, processing and storage of images **3D PACE *syngo*** By tracking the patients head 3D PACE reduces motion resulting in increased data quality beyond what can be achieved with a retrospective motion correction. As a result the sensitivity and specificity of BOLD experiments are increased. Features: - Real time prospective motion correction: Highest accuracy real time motion detection algorithm feeding a real time feed back loop to the acquisition system with updated positioning information - 3D motion correction for 6 degrees of freedom (3 translation and 3 rotation) - Motion related artifacts are avoided in first place instead of correcting for them retrospectively - Significant reduction of motion-related artifacts in statistical evaluations - Increased sensitivity and specificity of BOLD experiments **BOLD 3D Evaluation *syngo*** All tasks from statistical evaluation of the fMRI datasets to reading and exporting results are supported by BOLD 3D Evaluation *syngo:* Generation of statistical maps: - In cases an inline calculated statistical map is not available a statistical map can be generated easily using processing protocols. An intuitive editor UI allows the paradigm definition and offers the selection of head motion correction, image filters and statistical evaluation. - Predefined processing protocols and paradigms are available, which can be edited if required. Statistical evaluation using General Linear Model (GLM) - Transitions between passive and active states modeled by the hemodynamic response function. - Correction of low-frequency trends. - Corrects for time delays due to the BOLD-EPI slice order during a measurement. - Output of a t-value map and the GLM design matrix Inline monitoring of the fMRI exam - During an ongoing BOLD imaging exam results are calculated (by Inline BOLD imaging) and displayed in real time. - The results are displayed and continuously updated as an overlay on online adjustable, free angulated cut planes through the anatomical 3D data set. - The evolving signal time courses in task-related areas of activation can be displayed and monitored. Visualization of fMRI Results - Visualization with 3D volume rendering. - Superimposing on cut planes through the volume. - Interactive Navigation: Zoom, pan and rotate in 3D without noticeable delay. Free double oblique angulation of up to 6 cut planes. - Cine display of the BOLD time series and of EPI volumes in 3 orthogonal cuts for evaluation of non-corrected head motion.

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Part No. / Product	Description
(Continued) **14416943** **Neuro fMRI Package #T+D (Optional)**	Data Quality Monitoring - Based on the B0 field map, loaded automatically with the fMRI data, areas with less reliable results are indicated. **fMRI Trigger Converter** An optical trigger signal is available to trigger external stimulation devices in fMRI experiments. With the "fMRI Trigger Converter" this signal can be converted to an electrical signal (TTL/BNC and RS 232 interface for PC; modes: toggle or impulse).
14416941 **Spectroscopy Package #T+D (Optional)**	The Single Voxel Spectroscopy option is used to measure proton spectra from single voxels. The spectra may show alterations in brain metabolism e.g. in brain tumors, in degenerative changes of the brain and in metabolic diseases. The possibility of automatic adjustment, measurement and evaluation permits near automatic spectroscopy measurements. The whole procedure, including the evaluation of the spectra using the mandatory spectroscopy evaluation option, takes approx. 6 minutes and can be done by doctors or technologists. The 2D Chemical Shift Imaging option is used to measure 2D proton spectroscopic data to generate metabolite images e.g. in brain tumors, metabolic diseases of the brain and degenerative changes in brain metabolism. The whole procedure, including the generation of metabolite images using the spectroscopy evaluation takes approximately 8 minutes. The 3D Chemical Shift Imaging option is used to measure 3D proton spectroscopic data and allows for the evaluation of the spectra in measured volumes and the generation of metabolite images and spectral maps, e.g. in cases of brain tumors, metabolic diseases of the brain and degenerative changes in brain metabolism. The whole procedure, including the generation of metabolite images using the spectroscopy evaluation takes approximately 10-16 minutes Optimized protocols for 3D CSI in the prostate are also included. The evaluation software is fully integrated in *syngo* MR. Evaluation protocols adapted to the scan protocols carry out a complete and automatic evaluation of the measured data. The following functions are included: - Subsequent water suppression with optional phase correction - Apodization - Zero filling - Fourier transformation - Base line correction - Automatic or manual phase correction - Curve fitting and peak labeling - Summaries in tabular form of the essential results specifying the metabolites, their position, integrals and signal ratios in relation to a selectable reference. - Capability of exporting spectroscopy header information and data into a documented external format. - Automated peak normalization to tissue, water or reference. For CSI the following functions are included: - Spectra of selected voxels are automatically calculated, corrected for possible B0 deviations and displayed. - Spectral fit is automatically optimized for each voxel. - CSI data can be represented as spectral maps and colored metabolite images that can be superposed onto anatomical images.

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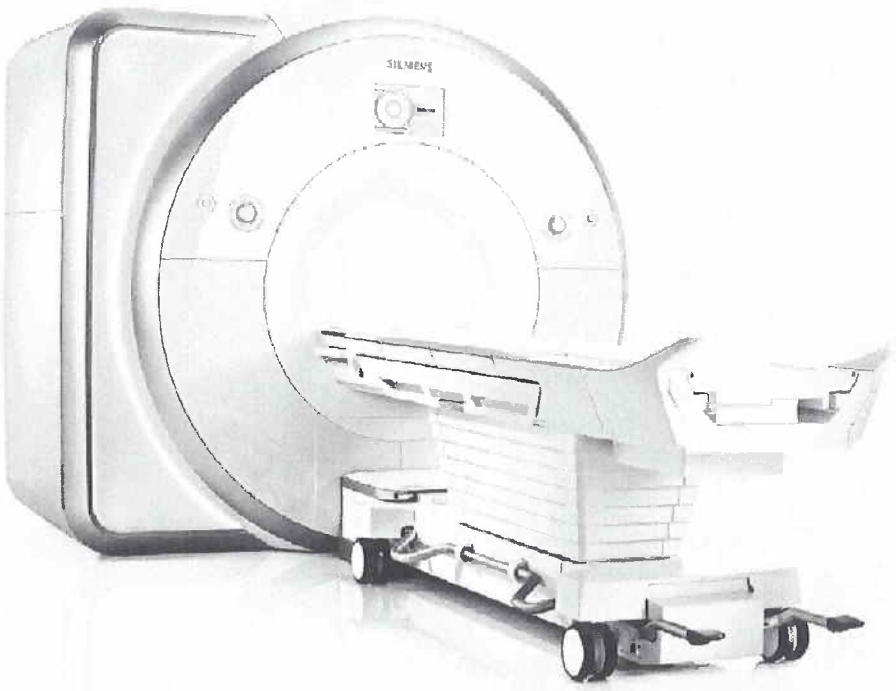
MAGNETOM AERA 1.5T
TYPICAL ROOM PLAN



The intended use for this Cut Sheet is to communicate the spatial requirements as well as the basic architectural, electrical, structural, and mechanical requirements for this piece of imaging equipment. The information provided in this document is for reference only, during the pre-planning stage, and therefore does not contain any site specific detailed requirements. This information is subject to change without notice. Federal, state and/or local requirements may impact the final placement of the components. It is the customer's responsibility to ensure that the final layout and placement of the equipment complies with all applicable requirements.

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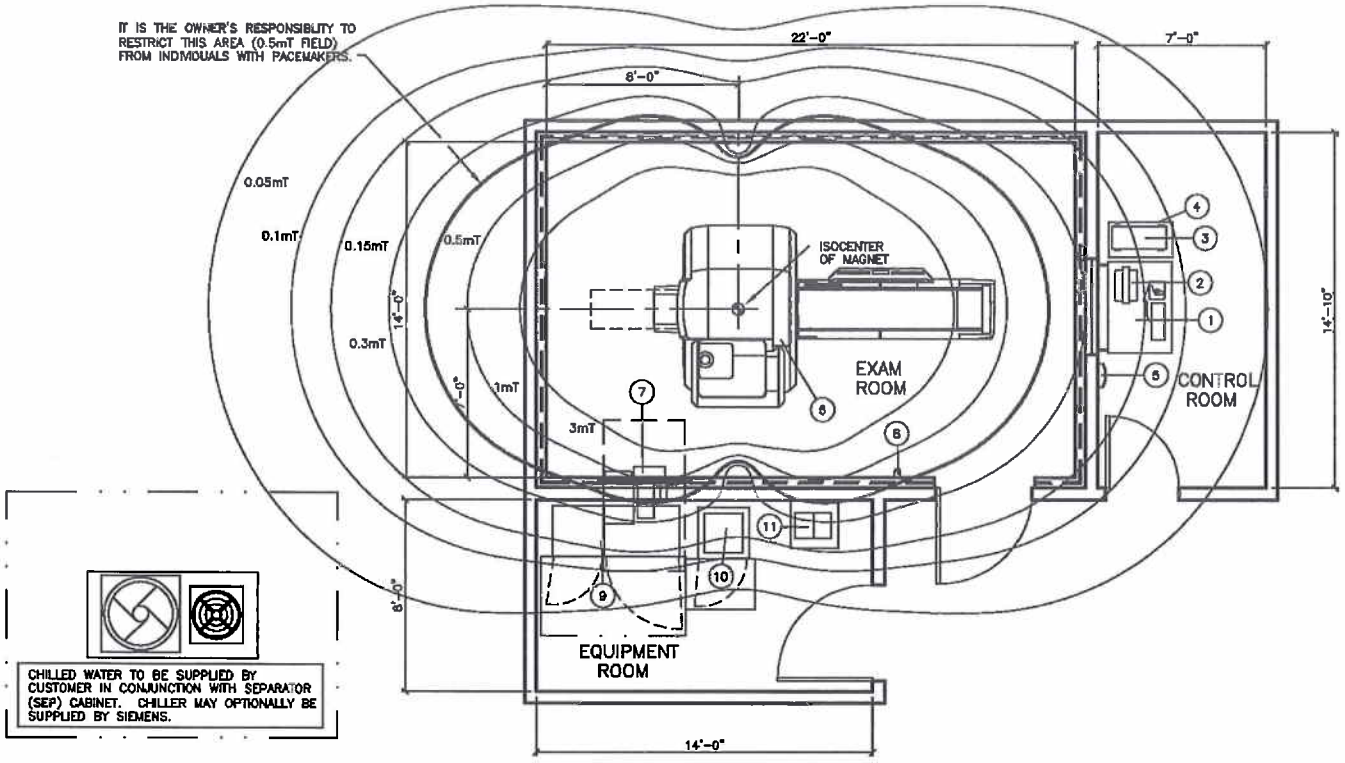
MAGNETOM AERA 1.5T

TYPICAL ROOM PLAN



TYPICAL PLAN SCALE: 1/8" = 1'-0"

EQUIPMENT LEGEND

NO	DESCRIPTION	SMS SYM	WEIGHT (LBS)	BTU/HR TO AIR	DIMENSIONS (INCHES) W	D	H	REMARKS
1	MRC OPERATING CONSOLE AND KEYBOARD	MRC	132	---	45 11/16	35 1/4	28 3/8	
2	COLOR MONITOR FOR MRC		22	239	18 5/16	16 15/16	4 3/4	ON CONSOLE/COUNTER
3	HOST PC MRC	PC	49	2,389	11	27	18 1/8	
4	CONTAINER FOR HOST 500		238	---	19 5/8	31 1/2	28 3/8	
5	ALARM BOX	AB	2	---	9	4	9	
6	1.5T MAGNET WITH COVERS AND PATIENT TABLE	B	10,093	3,415	91	170	86	
7	RF-FILTER PLATE	F1	285	853	46 1/2	21 3/4	21 1/2	
8	MAGNET STOP	MS	1	---	3	5	3	
9	ELECTRONICS CABINET (GPA/EPC CABINET)	GPA	3,307	13,649	61 1/2	26	77 1/2	
10	SEP CABINET	SEP	750	3,415	25 5/8	25 5/8	73 5/8	
11	POWERWARE 9130 UPS WITH EBM (OPTION)	UPS	186	1,257*	16 7/8	12 7/8	16 1/4	*1,755 ON BATTERIES

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MAGNETOM AERA 1.5T

SPECIFICATIONS

POWER REQUIREMENTS

VOLTAGE RANGE: 480 VAC ±10% FOR ALL LINE AND LOAD CONDITIONS.
VOLTAGE BALANCE: 2% MAXIMUM DIFFERENCE BETWEEN PHASES

FREQUENCY:	60 Hz ± 1.0 Hz
LINE IMPEDENCE:	95 mOHMS
STAND BY POWER CONSUMPTION	9.0 kW
TYPICAL POWER CONSUMPTION DURING EXAM	20.1 KW
CONNECTION VALUE (LESS THAN 5 MINUTES)	110 KVA
MOMENTARY POWER	140 KVA
RECOMMENDED TRANSFORMER	150 KVA
MR SYSTEM OVERCURRENT PROTECTION	150 AMPS
RECOMMENDED UPS	160 KVA
UPS SYSTEM OVERCURRENT PROTECTION	250 AMPS
MAX. ALLOWABLE VOLTAGE DROP AT MAX. POWER	6.0%

POWER REQUIREMENTS

DEMAND AND CAPACITY REQUIREMENTS NOTES

1) IF EQUIPMENT UPGRADE IS ANTICIPATED, INSTALLING ELECTRICAL POWER TO MEET THE REQUIREMENTS OF THE HIGHER POWER GRADIENT PACKAGE AT THE TIME OF INITIAL INSTALLATION WILL REDUCE THE COST TO UPGRADE THE ELECTRICAL SYSTEM LATER.

2) RECOMMENDED TRANSFORMER SIZE (SYSTEM WITHOUT UPS) IS BASED ON INDUSTRY STANDARD ISOLATION TRANSFORMER KVA RATINGS. SOURCE IMPEDANCE FEEDING THE MAGNETOM SYSTEM, INCLUDING ANY ISOLATION TRANSFORMERS, MUST MEET EQUIPMENT REQUIREMENTS AS LISTED HERE. SIEMENS RECOMMENDS A TRANSFORMER WITH COPPER WINDINGS, AN ELECTRO-STATIC SHIELD, AND A LOW IMPEDANCE (<3%) TO ENSURE THAT SOURCE IMPEDANCE REQUIREMENTS ARE MET.

3) OVERCURRENT PROTECTION IS SPECIFIED FOR SYSTEMS WITHOUT AN UNINTERRUPTIBLE POWER SUPPLY (UPS). ADDITION OF A UPS REQUIRES A HIGHER CAPACITY MAINS CONNECTION (DEPENDENT UPON UPS MODEL AND SIZE).
MAXIMUM FAULT CURRENT IS DEPENDENT UPON THE IMPEDANCE OF THE FACILITY ELECTRICAL SYSTEM. CUSTOMER'S ARCHITECT OR ELECTRICAL CONTRACTOR TO SPECIFY AIC RATING OF OVERCURRENT PROTECTION BASED ON FACILTY IMPEDANCE CHARACTERISTICS.

4) MOMENTARY POWER IS BASED ON A MAXIMUM RMS VALUE FOR A PERIOD NOT TO EXCEED FIVE (5) SECONDS, AS DEFINED IN NEC 517.2. STAND-BY AND AVERAGE CURRENT ARE SUBSTANTIALLY LOWER.

5) THE CONDUCTOR SIZE SHOULD BE SELECTED TO MEET THE VOLTAGE DROP REQUIREMENTS, TAKING INTO CONSIDERATION THE MAINS CAPACITY, RUN LENGTH, AND ANY ADDITIONAL TRANSFORMERS USED TO OBTAIN THE PROPER EQUIPMENT VOLTAGE LEVEL. NEMA STANDARD XR-9-1989 (R1994,R2000) PROVIDES GENERAL GUIDELINES FOR SIZING CONDUCTORS, TRANSFORMERS, AND ELECTRICAL SYSTEMS FOR MEDICAL IMAGING SYSTEMS.

6) LONG-TIME POWER IS BASED ON THE HIGHEST AVERAGE RMS VALUES FOR A PERIOD EXCEEDING 5 MINUTES DURING CLINICAL SYSTEM OPERATION, AS DEFINED IN NEC 517.2.

7) A CIRCUIT BREAKER WITH A HIGH INRUSH RATING (>8x RATED CURRENT) IS REQUIRED TO PERMIT SWITCH-ON OF THE UPS SYSTEM WITHOUT SPURIOUS TRIPPING. CIRCUIT BREAKERS WITH AN ADJUSTABLE MAGNETIC TRIP (SIEMENS FD6 SERIES OR SIMILAR) ARE HIGHLY RECOMMENDED.

NOISE LEVELS

SYSTEM ROOM	NOISE LEVEL / dB(A)
CONTROL ROOM	<55
EXAMINATION ROOM	86.1 dB(A) – 8 HOUR AVERAGE 108.2 dB(A) MAXIMUM
EQUIPMENT ROOM	<65

IT IS THE CUSTOMER'S RESPONSIBILITY TO ENSURE THAT ALL LOCAL/STATE/OSHA NOISE REGULATIONS ARE ADHERED TO. ADDITIONAL NOISE DATA MAY BE PROVIDED BY SIEMENS PROJECT MANAGER UPON REQUEST.

CEILING HEIGHTS

EXAM ROOM 7'-11" MINIMUM
CONTROL ROOM 6'-11 MINIMUM
EQUIPMENT ROOM 7'-3" MINIMUM

REMOTE SYSTEM DIAGNOSTICS

SIEMENS REMOTE SERVICES (SRS) REQUIRES A CONNECTION BETWEEN THE SRS REMOTE SERVER AND SIEMENS SYSTEMS VIA REMOTE LOCAL AREA NETWORK ACCESS, TO ENSURE THE UPTIME OF YOUR SYSTEM.

THIS SERVICE REQUIRES ONE OF THE FOLLOWING CONNECTION METHODS:
1. (PREFERRED) VPN – WHERE THE CUSTOMER HAS AVAILABLE A VPN CAPABLE FIREWALL OR OTHER VPN APPLIANCE.
2. (OPTIONAL) *SRS ROUTER* – CONNECTED TO ANALOG PHONE LINE VIA *ANALOG MODEM*, ETHERNET CONNECTION TO CUSTOMER'S LAN, AND A POWER OUTLET. NOTE: = *SUPPLIED BY SIEMENS*

FOR MORE INFORMATION

FOR MORE DETAILED PLANNING REQUIREMENTS FOR THIS SYSTEM, SEE THE TYPICAL FINAL DRAWING SET NUMBER: 10023

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MAGNETOM AERA 1.5T
SPECIFICATIONS

CHILLED WATER SUPPLY

A CHILLED WATER SUPPLY IS REQUIRED TO THE MRI SYSTEM 24 HOURS A DAY, YEAR ROUND FOR THE COLD HEAD AND GRADIENT SYSTEMS. THIS CAN BE PROVIDED BY A CENTRAL CHILLED WATER SUPPLY OR A SEPARATE STAND ALONE CHILLER THAT MEETS THE STATED REQUIREMENTS. THE CHILLED WATER CAN ALSO BE SUPPLIED BY A DEDICATED KRAUS ECO CHILLER AND INTERFACE PANEL.

WITHOUT THE USE OF A DEDICATED KRAUS CHILLER, A SEP (SYSTEM SEPARATOR CABINET), MUST BE INCLUDED WITH THE SIEMENS ORDER. THE PIPE SIZE BETWEEN THE KRAUS CHILLER AND INTERFACE PANEL, OR BETWEEN THE WATER SUPPLY AND SEP MUST BE 2 INCH UP TO 82 FEET, 2-1/2 INCH UP TO 148 FEET, CONSULT FOR LONGER PIPE. PERMISSIBLE MATERIALS THAT CAN BE USED FOR THE PIPING ARE: STAINLESS STEEL (V2A, V4A), NON-FERROUS METAL (COPPER, BRASS), SYNTHETIC MATERIAL, PLASTICS, BRAZING SOLDER, HARD SOLDER, OR FITTING SOLDER TYPE 3 AND 4. THERE ARE MATERIALS THAT MAY CAUSE DAMAGE TO THE COOLING SYSTEM AND CANNOT BE USED, THESE MATERIALS ARE ALUMINUM, IRON, CARBON STEEL, ZINC, ZINC PLATED STEEL, OR STANDARD STEEL PIPES.

THESE REQUIREMENTS ARE REQUIRED FOR NEW INSTALLATIONS, IF EXISTING WATER PIPES COMPLY WITH SIEMENS WATER SPECIFICATIONS, THEY DO NOT NEED TO BE REPLACED.

NORMAL TAP WATER MUST BE AVAILABLE FOR FILLING THE SECONDARY WATER CIRCUIT. THERE SHALL BE A HOSE BIB LOCATED WITHIN 65' OF THE SEP, IFP, ACC OR THE KRAUS CHILLER.

THE SUPPLY AND RETURN CHILLED WATER PIPES MUST BE LABELED. THE LOCATION OF THE LABELS MUST BE AT ALL CONNECTION AND REFILLING POINTS AND MUST CONTAIN FLOW DIRECTION AND CONTENTS.

ENVIRONMENTAL REQUIREMENTS

1) AIR CONDITIONING IS TO PROVIDE A TEMPERATURE OF 70°F ±5°F IN THE EXAM ROOM, 70°F±10°F IN THE EQUIPMENT & CONTROL AREAS, RELATIVE HUMIDITY OF 40-60% (NON-CONDENSING) IS REQUIRED EXAMINATION ROOM AND 40-80% (NON-CONDENSING) IN ALL OTHER AREAS WHERE SIEMENS EQUIPMENT IS INSTALLED. THESE CONDITIONS ARE TO BE MET AT ALL TIMES; 24 HOURS A DAY, 7 DAYS A WEEK.

2) A DEDICATED AIR CONDITIONING AND HUMIDIFICATION SYSTEM IS RECOMMENDED FOR THE EXAM ROOM. A MINIMUM AIR EXCHANGE RATE OF 6 TIMES PER HOUR FOR THE EXAM ROOM IS REQUIRED. IT IS RECOMMENDED TO INSTALL A FRESH AIR SYSTEM WITH 30%-50% FRESH AIR INTAKE.

AIR SUPPLY AND RETURN ABOVE THE FINISHED CEILING IN THE EXAM ROOM IS RECOMMENDED. EACH ROOM SHOULD HAVE A DEDICATED CONTROL AND SENSOR TO MONITOR AND ADJUST THE AIR.

3) THE HEAT INTO THE EXAM ROOM IS LESS THAN 10,236 BTU/HR. THE HEAT INTO THE EQUIPMENT ROOM IS LESS THAN 3,412 BTU/HR. THIS HEAT DISSIPATION IS FROM THE SIEMENS EQUIPMENT ONLY, AUXILIARY SUPPORT EQUIPMENT (ie UPS) AND LIGHTING MUST BE CONSIDERED FOR TOTAL HEAT LOADS.

4) IT IS IMPORTANT FOR FRESH AIR INTAKE SYSTEMS TO EXHAUST AIR DIRECTLY OUT OF THE BUILDING. THE EXHAUST AIR MUST NOT BE DEFLECTED INTO ANOTHER ROOM. THE MAGNET ROOM EXHAUST AIR SHOULD BE INSTALLED AT LEAST 6'-6" ABOVE FINISHED FLOOR.

5) THE AIR INTAKE OF THE AIR CONDITIONING SYSTEM MUST NOT BE LOCATED IN THE VICINITY OF THE QUENCH VENT EXHAUST.

6) IF THE INPUT DRAWS UPON AIR FROM OUTSIDE THE BUILDING, IT IS RECOMMENDED TO INSTALL AN ON-SITE FILTER TO REMOVE DUST PARTICLES GREATER THAN 10 MICRONS.

7) DO NOT LOCATE ANY HVAC DIFFUSERS ABOVE THE MAGNET. THERE SHALL NOT BE AIR BLOWING DIRECTLY ON THE MAGNET.

CHILLED WATER REQUIREMENTS

WATER REQUIREMENTS TO BE MEASURED AT THE SEP CABINET.

FLOW RATE:	23.78-29.05 GPM
WATER TEMPERATURE:	48°F ±4°F
BTU DISCHARGE TO THE WATER	204,729 BTU/HR
WATER PRESSURE	MAXIMUM 87 PSI
LOSS OF PRESSURE FOR SEP CABINET	14.5 PSI MAXIMUM
CHILLED WATER ACIDITY RANGE	6 pH TO 8 pH
CHILLED WATER HARDNESS	<250 ppm CALCIUM CARBONATE
CHLORINE GAS CONCENTRATION	<200 ppm
FILTRATION	500 µm

FOR INSTALLATION OF A KRAUS KSC 215 CHILLER, IT IS THE RESPONSIBILITY OF THE CUSTOMER/MECHANICAL CONTRACTOR TO PROVIDE A MIXTURE OF WATER WITH 35%-38% ETHYLENE GLYCOL PRIOR TO CHILLER START UP. DO NOT USE PROPYLENE GLYCOL OR AUTOMOTIVE ANTI-FREEZE.

THE AMOUNT OF THE MIXTURE MUST FILL THE CHILLER, MR SYSTEM AND PIPING (SUPPLY AND RETURN), SEE EXAMPLES BELOW.

(1) GALLON OF UNDILLUTED GLYCOL, OR (2) GALLONS OF WATER/GLYCOL MIXTURE MUST REMAIN ON SITE FOR USE AFTER START UP.

MIXTURE VOLUME INCLUDING SUPPLY & RETURN+15 GAL. CHILLER & MR

PIPE DIAMETER	TOTAL LENGTH	MIXTURE VOLUME	GLYCOL NEEDED
2"	100'	31.3 GALLONS	11.9 GALLONS
2"	200'	47.6 GALLONS	18.1 GALLONS
2.5"	100'	40.5 GALLONS	15.4 GALLONS
2.5"	200'	66.0 GALLONS	25.1 GALLONS

MIXTURE VOLUME = 3.14 x (PIPE RADIUS)^2 x PIPE LENGTH + 15 GALLONS.
GLYCOL AMOUNT = 35-38% OF MIXTURE VOLUME.

QUENCH VENT NOTES

LIQUID AND GASSEOUS HELIUM ARE USED IN THE OPERATION OF A SUPERCONDUCTING MRI SYSTEM. THE MECHANICAL CONTRACTOR SHALL PROVIDE A VENT, ACCORDING TO SIEMENS SPECIFICATIONS, TO EXHAUST GASSEOUS HELIUM FROM THE MAGNET TO OUTSIDE THE BUILDING. PLEASE SEE THE SIEMENS TYPICAL DRAWINGS FOR DETAILS.

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MAGNETOM AERA 1.5T
SPECIFICATIONS

PROTECTING THE ENVIRONMENT

PROTECTING THE IMMEDIATE ENVIRONMENT FROM THE EFFECT OF THE MAGNETIC FIELD REQUIRES CONSIDERATION. INFORMATION STORED ON MAGNETIC DATA CARRIERS SUCH AS DISKS, TAPES, AND CREDIT CARDS MAY BE ERASED IF IN CLOSE PROXIMITY. CAUTION WITH REGARD TO HEART PACEMAKERS MUST BE EXERCISED. MOST PACEMAKER UNITS EMPLOY A REED RELAY WHICH MAY CHANGE OPERATING MODE WHEN EXPOSED TO AN EXTERNAL MAGNETIC FIELD. THEREFORE, PACEMAKER USERS MUST BE KEPT AT A SPECIFIED DISTANCE FROM THE MAGNET WHICH IS DETERMINED BY THE MAGNETIC FIELD STRENGTH.

PROTECTING THE MAGNETIC FIELD

THE SIEMENS MAGNETOM UTILIZES A SUPERCONDUCTIVE MAGNET WITH AN EXTREMELY HOMOGENEOUS FIELD WITHIN THE MAGNET TO PROVIDE DISTORTION-FREE IMAGING. THE PRESENCE OF FERROMAGNETIC MATERIAL WITHIN THE VICINITY OF THE MAGNET CAN ADVERSELY AFFECT THE UNIFORMITY OF THE USEFUL MAGNETIC FIELD. THIS APPLIES TO STATIONARY FERROUS MATERIAL (STRUCTURAL STEEL) WHICH IS TO BE MINIMIZED. STATIONARY STEEL COMPENSATION MAY BE ACHIEVED BY MAGNET POSITIONING AND SELECTIVE USE OF SHIMS. FIELD DISTORTION ENCOUNTERED BY MOVING FERROMAGNETIC OBJECTS IS MORE DIFFICULT TO COMPENSATE AND MAY REQUIRE THE USE OF MAGNETIC SHIELDING.

MAGNETIC FRINGE FIELDS

MAGNETIC FIELDS MAY AFFECT THE FUNCTION OF DEVICES IN THE VICINITY OF THE MAGNET. THESE DEVICES MUST BE OUTSIDE CERTAIN MAGNETIC FIELDS. THE DISTANCES LISTED ARE FROM THE MAGNET ISOCENTER AND DO NOT CONSIDER ANY MAGNETIC ROOM SHIELDING.

X/Y AND Z AXIS	DEVICES
6'-1" / 9'-2" 3.0mT	SMALL MOTORS, WATCHES, CAMERAS, CREDIT CARDS, MAGNETIC DATA CARRIERS (SHORT-TERM EXPOSURE)
7'-3" / 11'-6" 1.0mT	COMPUTERS, MAGNETIC DISK DRIVES, OSCILLOSCOPES, PROCESSORS
8'-3" / 13'-2" 0.5mT	CARDIAC PACEMAKERS, X-RAY TUBES, INSULIN PUMPS, B/W MONITORS, MAGNETIC DATA CARRIERS (LONG-TERM STORAGE)
9'-9" / 16'-1" 0.2mT	SIEMENS CT SCANNERS
10'-4" / 17'-1" 0.15mT	COLOR MONITORS, SIEMENS LINEAR ACCELERATORS
13'-1" / 22'-3" 0.05mT	X-RAY IMAGE INTENSIFIERS, GAMMA CAMERAS, PET/CYCLOTRON, ELECTRON MICROSCOPES, LINEAR ACCELERATORS

THE OWNER/USER IS TO VERIFY THE LOCATION OF THE 0.5mT FIELD AND ENSURE THAT IT IS MAINTAINED AS A RESTRICTED AREA.

MAGNET SITING REQUIREMENTS

IT MUST BE ENSURED THAT THE MAGNET IS LOCATED SO THAT THE STABILITY AND HOMOGENEITY OF THE MAGNETIC FIELD ARE NOT ADVERSELY AFFECTED BY EXTRANEOUS FIELDS AND STATIC OR DYNAMIC FERROMAGNETIC OBJECTS.

X/Y AND Z AXIS	SOURCE OF INTERFERENCE
3'-6"	STEEL REINFORCEMENT RODS IN FLOOR - MAXIMUM 20 LBS/SQ. FT.
18'-1" / 21'-4"	STRETCHERS UP TO 110 LBS.
13'-1"	A/C CHILLERS
19'-9" / 23'-0"	TRANSPORT DEVICES UP TO 440 LBS.
21'-4 / 26'-3"	VEHICLES UP TO 2,000 LBS.
23'-0" / 31'-3"	ELEVATORS, TRUCKS UP TO 10,000 LBS.
39'-4"/26'-2"	AC TRANSFORMERS LESS THAN 100 KVA
41'-0"/32'-9"	AC TRANSFORMERS LESS THAN 250 KVA
42'-7"/39'-4"	AC TRANSFORMERS LESS THAN 650 KVA
45'-11"/49'-3"	AC TRANSFORMERS LESS THAN 1600 KVA
9'-10"/6'-6"	AC CABLES, MOTORS LESS THAN 100 AMPS
22'-11"/9'-10"	AC CABLES, MOTORS LESS THAN 250 AMPS
131'-2"	ELECTRIC RAILWAY SYSTEMS

FOR IRON OBJECTS LOCATED UP TO 45° FROM THE Z AXIS, THE DISTANCES FOR THE Z AXIS MUST BE USED.
REDUCTION IS POSSIBLE WITH STEEL SHIELDING.

MAXIMUM CABLE LENGTH

THERE ARE 3 DIFFERENT LENGTHS OF CABLE THAT ARE AVAILABLE FOR THE MRI SYSTEM DIFFERENTIATED BY MAXIMUM LENGTHS FROM THE MAGNET TO THE FILTER PANEL (INSIDE) AND FROM THE FILTER PANEL TO THE ELECTRONICS (OUTSIDE).

INSIDE	OUTSIDE
20'	4'
20'	32'
20'	39'

THE VERTICAL DISTANCE FOR CABLE TRAVEL FROM THE FILTER PANEL TO THE CABLE TRAY, AND FROM THE CABLE TRAY TO THE MAGNET MUST BE CONSIDERED.

THE MAXIMUM DISTANCE FROM THE ACC CABINET TO THE CONTROL CONSOLE IS 75 FEET.

SIEMENS

FOR REFERENCE ONLY,
NOT FOR CONSTRUCTION.

MAGNETOM AERA 1.5T
SPECIFICATIONS

RF SHIELDING

THE EXAMINATION AREA MUST BE SHIELDED TO PROVIDE A REDUCTION OF RADIO FREQUENCY WAVES EMANATING FROM EXTERNAL TRANSMITTERS. THE REQUIRED ATTENUATION IS 90dB IN THE FREQUENCY RANGE OF 15–128 MHz. IF CO-SITING TWO SYSTEMS EACH ROOM SHOULD BE 100 dB. THE RF SHIELD MUST BE TESTED BEFORE AND AFTER MAGNET PLACEMENT IN THE RF ROOM AND AFTER THE SIEMENS RF FILTER PANEL IS INSTALLED.

THE RF-SHIELDING MUST BE INSULATED FROM ALL GROUNDS SUCH THAT THE ONLY GROUND IS THE SINGLE POINT GROUND ON THE OUTSIDE OF THE RF-ROOM WALL. RESISTANCE ≥ 100 OHMS.

ALL ELECTRICAL LINES INTO THE RF ROOM MUST BE ROUTED THROUGH RF FILTERS (PROVIDED BY RF SHIELDING SUPPLIER).
ALL ELECTRICALLY NON-CONDUCTIVE SUPPLY LINES (E.G. FIBER OPTIC CABLES, OR HOSES) INTO THE RF ROOM MUST BE ROUTED THROUGH RF SEALED WAVEGUIDES (PROVIDED BY RF SHIELDING SUPPLIER).

FOR PRESSURE EQUALIZATION PURPOSES THE RF DOOR SHOULD OPEN TO THE OUTSIDE OF THE RF ROOM. AS AN ALTERNATIVE A 24"X24" OPENING IN THE RF ROOM FOR PRESSURE EQUALIZATION IS REQUIRED.

BUILDING VIBRATIONS

VIBRATION OF THE SITE HAS THE ABILITY TO AFFECT THE STABILITY AND HOMOGENEITY OF THE MAGNETIC FIELD. THEREFORE EXTERNAL VIBRATIONS OR SHOCKS AFFECTING THE MAGNET MAY DEGRAGE IMAGE QUALITY. IN THE THREE SPATIAL ORITENTATIONS THE BUILDING MUST NOT EXCEED ACCELERATION OF 0.001m/s or −80dB(g) g=9.81 m/s²

THE REQUIREMENT FOR a_{max} IS MEASURED AS MAXIMUM RMS VALUE PER FREQUENCY COMPONENT <0.5Hz IN THE FOURIER TRANSFORMATION OF THE RECORDED SIGNAL (SPECTRUM).

THE VIBRATION LEVEL OF CONTINUOUS VIBRATIONS (CAUSED BY AIR CONDITIONER, COMPRESSOR, ETC.) AT THE LOCATION OF THE MAGNET MUST NOT EXCEED THE SPECIFED VALUES.
FOR ALL NON-CONTINOUS TRANSIENT VIBRATIONS THE FIGURES SHOULD BE MULTIPLIED BY 4 (OR 12dB).

CONTACT SIEMENS PROJECT MANAGER FOR MORE DETAILS.

TRANSPORTING REQUIREMENTS

LARGEST ITEM – MAGNET – 9,566 LBS.

MINIMUM MAGNET DIMENSIONS WITH TRANSPORT WHEELS UNDER MAGNET:

7'-7" HIGH X 7'-7" WIDE X 5'-2" DEEP WITHOUT TABLE SUPPORT, 6'-0" DEEP WITH TABLE SUPPORT.

THE ROOF HATCH/DELIVERY OPENING SHOULD BE 4" LARGER.

TO TRANSPORT THE GPA/EPC CABINET (3,307 POUNDS) A MINIMUM ROOM HEIGHT OF 8'-9" IS REQUIRED, 8'-3" WITH WHEELS REMOVED, 8'-1" WITH WHEELS AND MAINS CONNECTION REMOVED.

Greg Bratcher - BJH So Co Project - Shielding Costs

From: Don Robert
To: Bratcher, Greg
Date: 8/20/2014 8:10 AM
Subject: BJH So Co Project - Shielding Costs

Hi Greg,

The South County Phase II project has been transitioned to me since Matt Bacon is no longer with BJC. The estimated cost of shielding the MRI is $60,000. Please let me know if you have any questions.

Don Robert
Sr. Project Manager

BJC Design & Construction
8300 Eager Road
Suite 600C
St. Louis, MO 63144

314.744.0305 (Direct)
314.273.0900 (Office
drr6360@bjc.org

Divider II: Proposal Description

Divider II. Proposal Description:

1. Provide a complete detailed project description.

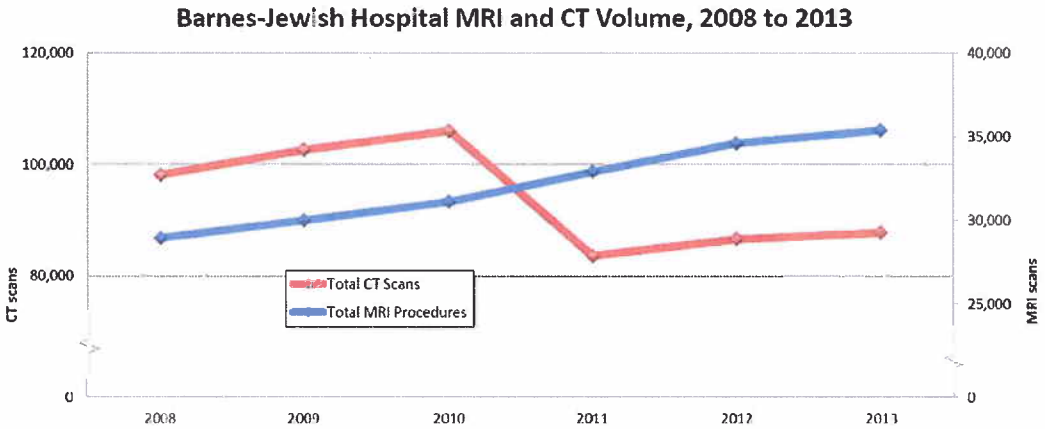
Barnes-Jewish Hospital proposes acquiring a Siemens Magnetom Aera 1.5 tesla MRI unit for use at a facility adjacent to the hospital's Siteman Cancer Center in south St. Louis County. MRI utilization at Barnes-Jewish Hospital substantially surpasses the CON criterion for adding the MRI unit.

MRI is an important part of modern medicine. Making use of the hydrogen atoms in our body's water molecules, an MRI unit generates a strong magnetic field to align the hydrogen atoms in one direction. Radio waves are then rapidly pulsed to disrupt this alignment. The hydrogen atoms emit their own radio signals between the pulses, and these faint signals are collected, amplified, and reconstructed with computers to create MRI images.

A growing body of research shows that a person's lifetime exposure to ionizing radiation—used in traditional X-rays and CT scans—needs to be carefully managed. This research was described in the *National Council on Radiation Protection and Measurements Report No. 160.* In response to these concerns, the US Food and Drug Administration launched its *Initiative to Reduce Unnecessary Radiation Exposure from Medical Imaging* in 2010. Medical device manufacturers and providers are working hard to achieve the radiation reduction goals agreed upon in these meetings.

An advantage to MRI imaging is that it uses no ionizing radiation.

MRI is a relatively young clinical tool, emerging in hospitals starting in the early 1980s. As experience using MRI grows, and research on its capabilities advances, it is being used in situations formerly requiring traditional ionizing imaging; in particular, CT imaging. As mentioned in a recent CON application for St. Louis Children's Hospital, BJC is committed to reducing patient's exposure to this radiation; the proposed MRI unit helps us continue to meet this goal.



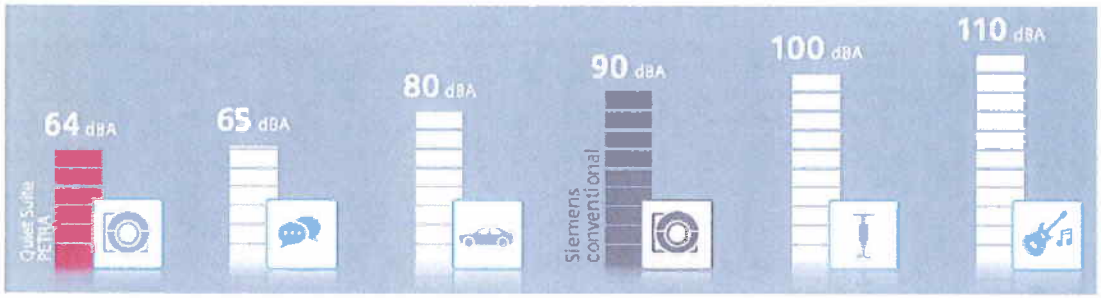
The Siemens Magnetom Aera is becoming the new workhorse of BJC's imaging suites. The machine offers several advantages:

First, this scanner has a unique short-bore, open-bore design, meaning the opening is wider and shorter than other similar strength MRI units while still maintaining the magnetic field required to produce beneficial images. It represents an ideal compromise between image quality and patient comfort. It is able to accommodate many patients who would otherwise seek an "open" MRI scan, while still providing the care team with the clinical information available only on a high-field-strength closed MRI unit.

Secondly, the Aera MRI has unique technology that allows for execution of concurrent scans of different body areas without the need to stop and switch out accessories specific for each particular scan, which typically drives up operational time on other MRI scanners.

Complementing these features is a new automation technology. This optimization technology monitors patient parameters, such as weight, height, age, breath rate, heart rate, etc., and concurrently tracks the area being studied. This information provides real-time, automated tuning of the scan to provide diagnoses-specific imaging. The same technology helps to ensure that future scans of the same person, for the same condition, are conducted under virtually identical conditions, ensuring that differences between scans are real anatomical differences and not differences due to changes in the way the two scans were conducted. As BJC standardizes on this platform, patients scanned in one location can use another, more convenient location for follow-up imaging with no complications.

Finally, a feature called Quiet Suite addresses a major source of noise during an MRI exam, which is one of the main complaints patients voice when getting scans on older machines. The MRI's harsh, repetitive jackhammer noise is caused by sharp switches in the magnetic gradient. In addition to conventional noise control—such as insulation—the Siemens unit has engineered methods to actually make the gradient switches quieter. Below is a chart that compares the sound levels of the Quite Suite unit and conventional MRI units.



The estimated cost of the project is $2,056,460. This cost figure includes all necessary software and accessories, and an allowance for providing shielding.

2. Provide a legible city or county map showing the exact location of the project.

3. Define the community to be served.

Barnes-Jewish Hospital is the largest hospital in Missouri and the largest private employer in the St. Louis region. A teaching hospital affiliated with the Washington University School of Medicine, Barnes-Jewish Hospital serves the complex health needs of patients across the Midwest, and the world.

The hospital and medical school are among the leading recipients of grants for medical research. Together, Washington University School of Medicine and Barnes-Jewish Hospital have co-developed several innovative bench-to-bedside research and treatment initiatives, including:

- The first U.S. surgery to restore voice to a patient with an artificial larynx.
- Innovative spinal-cord treatments, including brain imaging to verify recovery and a neurologic rehabilitation program.
- A lung transplant program that is one of the world's largest with more than 800 transplants, including the world's first double-lung transplant.
- Washington University heart surgeons at Barnes-Jewish Hospital developed procedures such as robotic heart surgery, off-pump (beating heart) surgery, and the Cox Maze procedure for treatment of atrial fibrillation.
- The world's first removal of a kidney through laparoscopic surgery.

A major reason for the hospital's success is its nursing staff. In recognition of their excellence, Barnes-Jewish Hospital was the first adult hospital in Missouri to be certified as a "Magnet Hospital" by the American Nurses Credentialing Center. The Magnet Award is the highest honor for hospital nursing.

Further distinguishing the hospital in terms of quality, all of its radiologic technicians are certified by the American Registry of Radiologic Technologists and all of the imaging equipment is regularly accredited through the rigorous process established by the American College of Radiology.

Barnes-Jewish Hospital's care extends into the community. Its refugee health department supports new immigrants, assisting patients in 33 different languages and dialects. The AWARE program counsels victims of domestic violence. The Siteman Cancer Center has several outreach programs, including community-based mammography and prostate screenings. The hospital provides more than 1,500 free community screenings annually.

Because of these programs, and many others, Barnes-Jewish Hospital serves a very wide-ranging service area. For simplicity, in the table on the next page we have summarized the hospital's service area as the US Census Bureau's Combined Statistical Area for St. Louis Missouri and Illinois:

Population of the St. Louis Metro CSA
Barnes-Jewish Hospital Service Area Approximation

State	County	State of Mo. Total Pop. Est., 2015	State of Mo. Pop. Est. for Age 65+, 2015	Claritas Total Pop. Est., 2013	Claritas Total Pop. Proj., 2018
MO	Franklin	106,652	15,936	102,426	103,846
MO	Jefferson	233,487	30,921	220,281	222,732
MO	Lincoln	65,293	7,571	53,661	55,214
MO	St. Charles	402,519	59,372	370,573	384,557
MO	St. Francois	67,349	10,562	65,805	66,499
MO	St. Louis	975,010	158,575	997,903	998,068
MO	St. Louis City	350,583	42,086	316,452	313,092
MO	Warren	36,410	5,814	32,503	32,538
		2,237,303	330,837	2,159,604	2,176,546
IL	Bond			17,670	17,550
IL	Calhoun			4,996	4,877
IL	Clinton			38,169	38,752
IL	Jersey			22,821	22,622
IL	Macoupin			47,572	47,347
IL	Madison	Not Available		267,354	264,920
IL	Marion			39,198	38,894
IL	Monroe			33,708	34,736
IL	St. Clair			270,384	271,012
				741,872	740,710
		Service Area Total Population		2,901,476	2,917,256

4. Provide 2005 Population projections.

The population for the entire service area is 2.9 million, and is documented above. The state-generated population is 2,237,303, and is separated out in the table below.

State	County	State of Mo. Total Pop. Est., 2015	State of Mo. Pop. Est. for Age 65+, 2015
MO	Franklin	106,652	15,936
MO	Jefferson	233,487	30,921
MO	Lincoln	65,293	7,571
MO	St. Charles	402,519	59,372
MO	St. Francois	67,349	10,562
MO	St. Louis	975,010	158,575
MO	St. Louis City	350,583	42,086
MO	Warren	36,410	5,814
		2,237,303	330,837

5. Provide other statistics to document the size and validity of any user-defined geographic service area.

Barnes-Jewish Hospital has an unusually large and wide-ranging service area.

Barnes-Jewish Hospital has been named to the Honor Roll of hospitals in *US News & World Report*'s annual ranking of hospitals for 22 consecutive years. Of the 5,000-plus hospitals in the US, only those scoring top rankings in six or more specialties are named to the Honor Roll; this represents less than 1% of all US hospitals. Our clinical partner, Washington University School of Medicine, has ranked in the top ten of *US News & World Report's* medical schools for over a decade. In all, 17 Nobel Laureates have been associated with Washington University School of Medicine.

This level of clinical and research excellence draws referrals from a large catchment area. Barnes-Jewish Hospital and Washington University School of Medicine are the only institutions within 300 miles that have been so highly ranked—many of their patients represent the most complex medical cases, referred here from other hospitals as each patient's last, best hope.

Barnes-Jewish Hospital and Washington University School of Medicine have achieved numerous acknowledgments for excellence; among these, are:

- **The Mallinckrodt Institute of Radiology.** Mallinckrodt is one of the oldest radiology services in the country, established just fifteen years after Röntgen's discovery of the X-ray. Today, it is recognized as one of the largest and most scientifically sophisticated radiology centers in the world—more than 50 chairs of academic radiology departments were trained or taught at Mallinckrodt.

- **The Center for Clinical Imaging Research** provides advanced imaging resources and multiple levels of support to clinical investigators. It is one of the most sophisticated centers for imaging research in the world. Equipped with the most advanced imaging equipment available, and staffed with experts in all fields, the center attracts this generation's most promising researchers. The mission of the center "is to establish a preeminent and innovative clinical imaging research environment that links basic science and discovery efforts to clinical practice."

- **First in Missouri and first in St. Louis to receive Level I verification** from the American College of Surgeons for the hospital's trauma center. Barnes-Jewish Hospital is the only ACS-verified Level I trauma center in Missouri, Illinois, and Arkansas.

- **A Top Five Trauma Center**. The National Foundation for Trauma Care has identified Barnes-Jewish Hospital as one of the top five trauma centers in the United States, based on the hospital's preparedness for disaster response.

- **Primary Stroke Center.** The Joint Commission certified Barnes-Jewish Hospital as a Primary Stroke Center—the first hospital in the St. Louis area to receive the

distinction. Certification as a Primary Stroke Center signifies that Barnes-Jewish Hospital has the critical elements in place to respond quickly to patients suspected of having a stroke, and has the skill and resources to achieve long-term success in improving outcomes for stroke patients.

- **Siteman Cancer Center**. Siteman is the only cancer center in Missouri to receive the designation as a National Cancer Institute Comprehensive Cancer Center, and is one of only 41 comprehensive cancer centers in the country. The NCI-designated cancer centers program recognizes centers around the country that meet rigorous criteria for world-class, state-of-the-art programs in multidisciplinary cancer research.

- **Epilepsy Center of Excellence.** The Barnes-Jewish Hospital epilepsy center is among the first three in the nation to receive certification from The Joint Commission for its efforts to care for patients with seizures.

- **The Charles F. and Joanne Knight Alzheimer's Disease Research Center**. The Knight Center is one of 29 centers funded or supported by the National Institute on Aging with the collective aim of facilitating advanced research on clinical, genetic, neuropathological, neuroanatomical, biomedical, psychosocial, and neuropsychological aspects of Alzheimer's disease and related brain disorders. The Center is at the forefront of a worldwide effort to uncover key causal factors in the development of Alzheimer's disease, with a goal of developing more effective treatments and an eventual cure.

6. Identify specific community problems or unmet needs the proposal would address.

As the demand for MRI imaging from referring physicians continues to grow, the proposed project will serve two particular needs:

1. Accommodate the desire, from both patients and doctors, to provide non-ionizing imaging whenever clinically feasible. More and more, doctors and patients are voicing concerns over the total radiation exposure patients potentially face over the course of a lifetime. MRI, which involves no ionizing radiation, meets this criterion *and* provides excellent clinical information.

2. Provide easier access for chronically ill patients. We have heard from many patients that while the quality and service provided by Barnes-Jewish Hospital is without peer, regular visits to the Central West End campus can be time consuming…taking time away from school, time away from work, and for the critically ill, time away from anything else other than hours driving on the highway. The proposed unit will make access easier for a large number of current and prospective patients and their families.

7. Provide historical utilization for each of the past three years and utilization projections through the first three years of operation of the new equipment.

The tables outline the historical and projected MRI volume for the Barnes-Jewish Hospital MRI operation. The satellite facility will be an extension of the hospital. As such, the tables below reflect total MRI volume for both locations.

HISTORICAL MRI Volume at Barnes-Jewish Hospital

	2011	2012	2013
IP MRI Proced.	8,508	8,596	8,609
OP MRI Proced.	24,376	26,017	26,801
Total MRI Proced.	32,884	34,613	35,410

PROJECTED MRI Volume at Barnes-Jewish Hospital

	2014	2015	2016	2017
Total MRI Proced.	36,118	36,841	37,577	38,329

8. Provide the methods and assumptions used to project utilization.

Utilization was projected based upon market data and extensive past experience with MRI. These trends are expected to continue, with some extra considerations. Equalization of volume is expected between the two campuses and is reflected in the volume figures. Furthermore, while trend toward favoring MRI over CT has leveled in recent years, it is expected to incrementally continue as research and advancements in technology provide new uses for MRI. A conservative estimate of these trends is also factored in to the MRI estimates.

9. Document that consumer needs and preferences have been included in planning this project and describe how consumers had an opportunity to provide input.

Barnes-Jewish Hospital has a board comprised of community and business leaders. This group's counsel has been solicited and many of their ideas have been incorporated into components of the project. In addition, a public notice, seeking comment, has been published in the *St. Louis Post-Dispatch*, and was also posted to the paper's web site for a week. Furthermore, as is a standard process throughout BJC, departmental planning teams incorporate feedback received from doctors and from patient-care staff, who aggregate the needs and preferences of patients.

10. Provide copies of any petitions, letters of support or opposition received.

See attached.

Divider II: Attachments

BARNES-JEWISH HOSPITAL WILL APPLY TO THE MO. HEALTH FACILITY REVIEW

Barnes-Jewish Hospital will apply to the Mo. Health Facility Review Committee for acquisition of an MRI unit to be located near its Siteman Cancer Center-South. Comments or concerns can be directed to Greg Bratcher, 314-286-0629. (Originally published in the St. Louis Post-Dispatch from 08/15/2014 to 08/16/2014)

Posted in Legal on Friday, August 15, 2014 12:00 am.

MISSOURI STATE CAPITOL
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573-751-0220 PHONE
573-751-4564 FAX

MISSOURI SENATE

SCOTT SIFTON
DISTRICT 1

July 29, 2014

Greg Bratcher
Director, Policy Analysis
BJC HealthCare
4901 Forest Park Ave
Suite 1220/MS 90-75-574
St. Louis, MO 63108

Dear Mr. Bratcher,

Barnes-Jewish Hospital is applying for a Certificate of Need for a project at I-55 and Butler Hill Road. This new facility will offer outpatient services in an easy-to-access location, and in order to better serve these patients, the clinicians would like to have an MRI on-site. This portion of the project would need CON review, so please convey my support for this to the Missouri Health Facilities Review Committee.

The hospital's South County location of its Siteman Cancer Center has proven very popular. Open for a little over a year, the Siteman facility has provided South County residents easy access to Barnes-Jewish Hospital's world-class cancer care. The new outpatient facility will replicate this access for other medical specialties.

Doctor's offices for orthopedic specialists, obstetricians, and primary care physicians will be the main occupants of the new facility. To support these practices, the facility will also house two outpatient operating rooms, a lab, outpatient rehabilitation spaces, and an imaging suite. These support services, including the proposed MRI, will make it easier for patients to get all the tests and treatments they need in one location.

Again, please convey my support for this important project to the committee.

Yours truly,

Scott Sifton

Senator Scott Sifton
District 1

SS/nel

CAPITOL OFFICE
State Capitol
201 W. Capitol Avenue
Jefferson City, MO 65101
Tele: 573-751-3719
Fax: 573-522-0494

E-Mail:
vicki.englund@house.mo.gov

COMMITTEES

Special Standing Committee on Small Business
(Ranking Member)

Appropriations- Revenue, Transportation and Economic Development

Economic Development

Elementary and Secondary Education

Downsizing State Government

MISSOURI HOUSE OF REPRESENTATIVES
Vicki Englund
State Representative
94th District

July 28, 2014

Greg Bratcher
Director, Policy Analysis
BJC HealthCare
4901 Forest Park Ave, Suite 1220/MS 90-75-574
St. Louis, MO 63108

Dear Mr. Bratcher:

I understand that Barnes-Jewish Hospital is building a new outpatient facility at I-55 and Butler Hill Road. In order to serve the patients coming to this facility, Barnes-Jewish Hospital seeks to add an MRI, which will require a Certificate of Need. Please convey my support for this to the Missouri Health Facilities Review Committee.

Barnes-Jewish Hospital is widely recognized for its world-class medical care; however, access to this care from South St. Louis County can be time-consuming for patients and families. The hospital's recently opened South County location for the Siteman Cancer Center has proven very popular due to its easy access. This project will replicate this access for other medical services.

The facility will primarily serve as doctor's offices for orthopedic specialists, obstetricians, and primary care physicians. To support these practices, the facility will also house two outpatient operating rooms, a lab, outpatient rehabilitation spaces, and an imaging suite. These support services, including the proposed MRI, will make it easier for patients to get all the tests and treatments they need in one location.

On behalf of the constituents of the 94th District, we look forward to the opening of this convenient new facility.

Best Regards,

Vicki Englund

Representative Vicki Englund, District 94

Washington University in St. Louis
SCHOOL OF MEDICINE

R. Gilbert Jost, M.D.
Elizabeth Mallinckrodt Professor
Chair, Department of Radiology
School of Medicine

Director of the Institute

August 13, 2014

Greg Bratcher
BJC HealthCare, Director, Policy Analysis
4901 Forest Park Ave
Suite 1220/MS 90-75-574
St. Louis, MO 63108

Dear Mr. Bratcher:

Barnes-Jewish Hospital will seek a Certificate of Need to add an MRI to a new outpatient facility at I-55 and Butler Hill Road. This project will be a key component of our efforts to better manage population health. Please convey my support for this project to the Missouri Health Facilities Review Committee.

The delivery of healthcare going forward will focus on management of the overall health of large populations in our service area. The episodic care our American health system has delivered is quickly evolving into a system that focuses on early prevention and regular health maintenance. Easy access to outpatient care will play an increasingly critical role in managing longterm health.

We have found that some patients from the southern St. Louis metro area find access to our Central West End campus to be confusing and time-consuming. The hospital's recently opened South County location for the Siteman Cancer Center has proven very popular due to its easy access. This project will replicate this access for other medical services.

The facility will primarily serve as doctor's offices for orthopedic specialists, obstetricians, and primary care physicians. To support these practices, the facility will also house two outpatient operating rooms, a lab, outpatient rehabilitation spaces, and an imaging suite. These support services, including the proposed MRI, will make it easier for patients to get all the tests and treatments they need in one location

One of our goals is to make access to our world-class care easily available to all who seek it. This project facilitates that goal. I urge your support of this important project.

Best Regards,

R. Gilbert Jost, MD
Chairman, Department of Radiology
Director, Mallinckrodt Institute of Radiology

MIR Mallinckrodt Institute of Radiology
Campus Box 8131, 510 South Kingshighway Boulevard, St. Louis, Missouri 63110, (314) 362-7100,
Fax: (314) 361-5428, *jostg@mir.wustl.edu*

Divider III: Community Need Criteria & Standards

Divider III. Community Need Criteria and Standards:

1. For new units address the need formula for the proposed geographic service area.

NA

2. For new units, address the minimum annual utilization standard for the proposed geographic service area.

NA

3. For any new unit where specific need and utilization standards are not listed provide the methodology for determining need.

NA

4. For additional units, document compliance with the optimal utilization standard, and if not achieved, provide documentation to justify the additional unit.

For the past three years, Barnes-Jewish Hospital has exceeded the CON criterion for an additional MRI by more than 500 scans. The table, below, uses data provided to the state in the "2013 Annual Licensing Survey of Missouri Hospitals" (formerly known as *Missouri Hospital Profiles*) to demonstrate compliance with this criterion.

	2011	2012	2013
IP MRI Proced.	8,508	8,596	8,609
OP MRI Proced.	24,376	26,017	26,801
Total MRI Proced.	32,884	34,613	35,410
Avg per machine	***3,654***	***3,846***	***3,934***

5. For evolving technology address the following:

– Medical effects as described and documented in published scientific literature;

NA

– The degree to which the objectives of the technology have been met in practice;

NA

– Any side effects, contraindications or environmental exposures;

NA

– The relationships, if any, to existing preventive, diagnostic, therapeutic or management technologies and the effects on the existing technologies;

NA

– Food and Drug Administration approval;

NA

– The need methodology used by this proposal in order to assess efficacy and cost impact of the proposal; and

NA

– The degree of partnership, if any, with other institutions for joint use and financing.

NA

Divider III: Attachments

NO MATERIALS IN THIS DIVIDER

Divider IV: Financial Feasibility Review Criteria & Stnds.

Divider IV. Financial Feasibility Review Criteria & Standards:

1. ***Document that sufficient financing is available by providing a letter from a financial institution or an auditor's statement indicating that sufficient funds are available.***

   See previously submitted federal 990 forms for BJC HealthCare.

2. ***Provide Service-Specific Revenues and Expenses (Form MO 580-1865) projected through three (3) years beyond project completion.***

   See attached financial forms.

3. ***Document how patient charges were derived.***

   Charges, in general, are arrived at by determining the reasonable and customary unit charge for delivering a given procedure through routine market checks of pricing at other facilities, and comparing the expected unit cost using a cost accounting package tailored specifically for hospitals. Finally, annual inflation adjustments are made, usually averaging 2% to 3%.

4. ***Document responsiveness to the needs of the medically indigent.***

   BJC is the largest provider of charity care, unreimbursed care, and community benefits in the state of Missouri. Barnes-Jewish Hospital has a long-standing policy of providing charity care and reduced-fee care to those in need. This policy will continue.

   The hospital offers financial counseling for all patients to ensure adequate coverage is obtained. For patients who are indigent, our financial counselors assist these families in obtaining Medicaid assistance. If financial assistance is not attainable, charity care may be extended as appropriate. The hospital financial assistance guidelines are based on family size and income relative to the U.S. poverty level guidelines. Each case is reviewed on an individual basis.

   Barnes-Jewish Hospital is also an important link in the wellbeing of patients living in some of the community's underserved areas. Here are some of the community health programs and services Barnes-Jewish Hospital provided in 2013:

   - Provided 84 free educational events, such as health fairs
   - Reached 62,087 community members with these events
   - Provided 31,749 free flu shots
   - Provided 1,528 free health screenings, including 1,095 blood pressure screenings, 181 stroke risk screenings, and 158 cancer screenings

Divider IV: Attachments

Certificate of Need Program

SERVICE-SPECIFIC REVENUES AND EXPENSES

Historical Financial Data for Latest Three Years plus Projections Through Three Years Beyond Project Completion

(Use an individual form for each affected service with a sufficient number of copies of this form to cover entire period, and fill in the years in the appropriate blanks.)	Year 2011	Year 2012	Year 2013
Amount of Utilization:*	32,884	34,613	35,410
Revenue:			
Average Charge**	$3,178	$3,379	$3,595
Gross Revenue	$104,505,352	$116,957,327	$127,298,950
Revenue Deductions	71,130,084	81,919,467	92,573,606
Operating Revenue	33,375,268	35,037,860	34,725,344
Other Revenue	0	0	0
TOTAL REVENUE	**$33,375,268**	**$35,037,860**	**$34,725,344**
Expenses:			
Direct Expense			
Salaries	6,192,382	6,621,828	6,915,804
Fees	0	0	0
Supplies	2,441,633	2,580,298	2,485,449
Other	67,222	26,951	74,603
TOTAL DIRECT	$8,701,237	$9,229,077	$9,475,856
Indirect Expense			
Depreciation	2,692,290	2,487,726	3,611,034
Interest***	0	0	0
Overhead****	3,762,660	4,210,603	4,583,281
TOTAL INDIRECT	$6,454,950	$6,698,329	$8,194,315
TOTAL EXPENSE	**$15,156,187**	**$15,927,406**	**$17,670,171**
NET INCOME (LOSS):	**$18,219,081**	**$19,110,454**	**$17,055,173**

* Utilization will be measured in "patient days" for licensed beds, "procedures" for equipment, or other appropriate units of measure specific to the service affected.

** Indicate how the average charge/procedure was calculated.

*** Only on long term debt, not construction.

**** Indicate how overhead was calculated.

Certificate of Need Program

SERVICE-SPECIFIC REVENUES AND EXPENSES

Historical Financial Data for Latest Three Years plus Projections Through Three Years Beyond Project Completion

(Use an individual form for each affected service with a sufficient number of copies of this form to cover entire period, and fill in the years in the appropriate blanks.)	Year 2014	Year 2015	Year 2016
Amount of Utilization:*	36,118	36,841	37,577
Revenue:			
Average Charge**	$3,775	$3,964	$4,162
Gross Revenue	$136,345,450	$146,037,724	$156,395,474
Revenue Deductions	100,900,923	109,525,225	118,865,537
Operating Revenue	35,444,527	36,512,499	37,529,937
Other Revenue	0	0	0
TOTAL REVENUE	**$35,444,527**	**$36,512,499**	**$37,529,937**
Expenses:			
Direct Expense			
Salaries	7,265,744	7,633,390	8,019,640
Fees	0	0	0
Supplies	2,611,213	2,743,340	2,882,153
Other	78,378	82,344	86,510
TOTAL DIRECT	$9,955,335	$10,459,074	$10,988,303
Indirect Expense			
Depreciation	3,647,144	3,683,616	3,720,452
Interest***	0	0	0
Overhead****	4,908,694	5,257,211	5,630,473
TOTAL INDIRECT	$8,555,838	$8,940,827	$9,350,925
TOTAL EXPENSE	**$18,511,173**	**$19,399,901**	**$20,339,228**
NET INCOME (LOSS):	**$16,933,354**	**$17,112,598**	**$17,190,709**

* Utilization will be measured in "patient days" for licensed beds, "procedures" for equipment, or other appropriate units of measure specific to the service affected.

** Indicate how the average charge/procedure was calculated.

*** Only on long term debt, not construction.

**** Indicate how overhead was calculated.

Certificate of Need Program

SERVICE-SPECIFIC REVENUES AND EXPENSES

Historical Financial Data for Latest Three Years plus Projections Through Three Years Beyond Project Completion

(Use an individual form for each affected service with a sufficient number of copies of this form to cover entire period, and fill in the years in the appropriate blanks.)

	Year 2017	Year 20??	Year 20??
Amount of Utilization:*	38,329	0	0
Revenue:			
Average Charge**	$4,370	$0	$0
Gross Revenue	$167,497,730	$0	$0
Revenue Deductions	128,980,055	0	0
Operating Revenue	38,517,675	0	0
Other Revenue	0	0	0
TOTAL REVENUE	**$38,517,675**	**$0**	**$0**
Expenses:			
Direct Expense			
Salaries	8,425,433	0	0
Fees	0	0	0
Supplies	3,027,990	0	0
Other	90,888	0	0
TOTAL DIRECT	$11,544,311	$0	$0
Indirect Expense			
Depreciation	3,757,656	0	0
Interest***	0	0	0
Overhead****	6,030,236	0	0
TOTAL INDIRECT	$9,787,892	$0	$0
TOTAL EXPENSE	**$21,332,203**	**$0**	**$0**
NET INCOME (LOSS):	**$17,185,472**	**$0**	**$0**

* Utilization will be measured in "patient days" for licensed beds, "procedures" for equipment, or other appropriate units of measure specific to the service affected.

** Indicate how the average charge/procedure was calculated.

*** Only on long term debt, not construction.

**** Indicate how overhead was calculated.